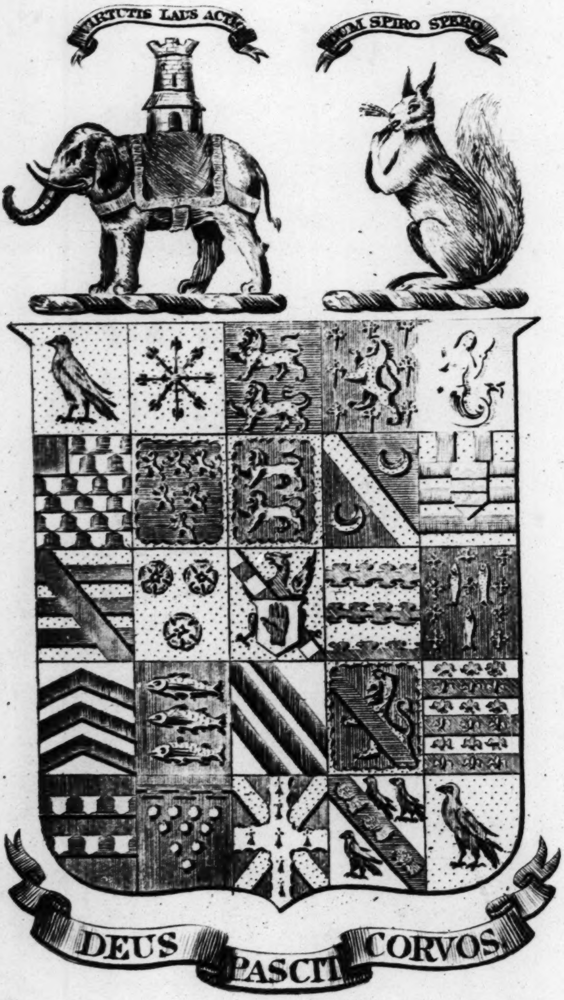
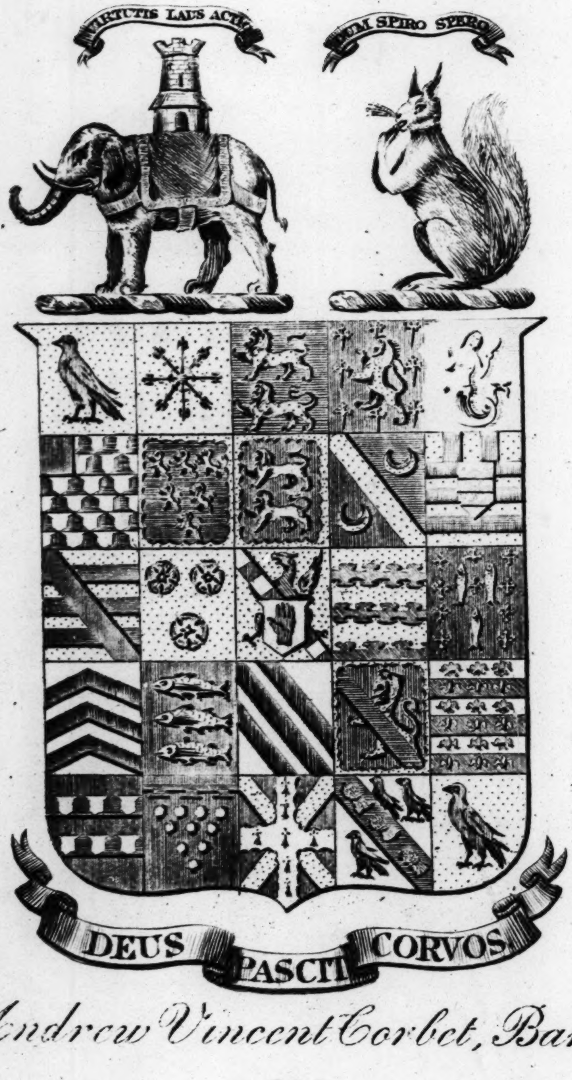


Andrew Vincent Corbet, Bart.

1835.



Andrew Vincent Corbet, Bart.

1835.

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Architecture
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THE
Theory and *Practice*
OF
Architecture:
OR
VITRUVIUS
AND
VIGNOLA *Abridg'd.*

The FIRST,

By the famous Mr. *Perrault*, of the Royal Academy of *Sciences* in *France*, (and carefully done into *Engliſh.*) And the other by *Joſeph Moxon*; and now accurately publiſh'd the *Fifth Time.*

LONDON:
Printed for *R. Wellington*, at the *Dolphin* and *Crown* in St. *Paul*'s Church Yard, 1703.

BRITISH MUSEUM
23 JUN 50

TO

My Worthy Friend

Mr. **MURREY.**

SIR,

D*EDICATIONS* are grown now a-days ſo faſhionable, as to be, almoſt, accounted one of the Eſſential Parts of a Book: But then the ill Uſe ſome Writers make of theſe ſolemn Addreſſes, together with the ill Choice of their Patrons, do often bring both into Diſeſteem. And, indeed, what can be more rediculouſly fulſom, than to ſee *Love* and *Poetry* patroniz'd by the *States-man*? *War*, by the *Prelate*? And *Divinity*, by the *Soldier*?

To avoid the Fault I condemn, and at the ſame time, to give You a publick Mark of my Affection and Friendſhip, I thought I could not do better, than to prefix your Name to this Treatiſe of *Architecture*; a Science which has a near Relation, and is abſolutely neceſſary to the Art of *PAINTING*, of which You are Univerſally Allow'd to be the greateſt *Engliſh* Maſter.

And, now, Sir, ſhould I follow the common Drift of *Epiſtles Dedicatory*, it would naturally lead me into the Commendation of Your Bold and Skilful Pencil; but Your noble Performances ſpeak beſt their own Praiſe; and as they gain You an extended Reputation when Living, ſo the Laſtingneſs of Your well-laid Colours, will both preſerve the true Repreſentations of others to Poſterity, and make Your own Name immortal.

Leſs than this I could not ſay, without doing Your Merit wrong; and to ſay more, would, I am ſure, make your Modeſty uneaſy: Therefore I conclude, with hearty Wiſhes that you may long enjoy the Fruits of Your Labours, and with deſiring You to believe me,

SIR,

Your moſt humble, and

Affectionate Friend and Servt.

A. BOYER.

THE

PREFACE.

VITRUVIUS *was certainly the moſt Knowing, and Skilful* Architect, *that ever liv'd. He had the Honour to be Employ'd by* Julius Cæſar, *and* Auguſtus, *the two Greateſt, and moſt Magnificent Emperors of ancient* Rome: *In an Age when all Things, eſpecially* Architecture, *ſeem'd to have attain'd the higheſt Degree of Perfection.*

His Works are full of ſuch a wonderful Variety of Matters, and theſe treated with ſuch a ſingular Erudition, that it plainly appears, that this great Man had acquired that profound Knowledge, which is neceſſary for his Profeſſion, by more excellent Methods than the bare Exerciſe, and ordinary Practiſe of a mechanical Art, could poſſibly ſuggeſt. He was, indeed, compleat in all the Liberal Arts *and* Sciences; *and by an early, and conſtant Application of his great Wit to the Contemplation of the moſt abſtruſe*

ſtruſe Things, he had acquir'd a certain Facility, which meer Mechanicks have not, of penetrating into the deepeſt Secrets, and of Maſtering all the Difficulties of ſo vaſt an Art, *as that of* Architecture.

However, there are ſo many Things in his Writings, that do not, directly, belong to Architecture, *that one would think they were leſs fitted to inſtruct thoſe that have a Deſign to learn the Precepts of this Art, than to perſwade the World, that our Author was a Perſon of the greateſt Merit, and of the moſt comprehenſive Genius. 'Tis for this Reaſon that ſeveral* Abridgments *of* Vitruvius *have been publiſh'd in moſt of the Modern Languages; but none of the former* Epitomizers *have follow'd the Scheme which* Philebert de l'Orme, *a* French-*Man, has given us in his Third Book: He wiſhes that thoſe who ſet about Abridging of* Vitruvius, *ſhould methodically digeſt the Matters which are confuſedly treated of in this Author; and Collect together into one Chapter, what they find diſpers'd up and down in ſeveral Places. This Method, which is certainly of great Uſe for the better Apprehending and Retaining Things of this Nature, has been carefully obſerv'd in this Treatiſe compos'd by Monſieur* Perrault, *of the Royal Accademy of Sciences in* France, *who has been very exact in inſerting nothing in it, that is not in* Vitruvius; *and* *has omitted nothing that does eſſentially belong to* Architecture, *and is to be ſound in that Author. In ſhort, this little Book is* Vitruvius *every Line and Thought on't; tho' it would be almoſt as hard to refer each Sentence, Rule, or Precept, to the very Place where it was taken, as to bring every diſtinct drop in a Cask of Wine, to the particular Grape from whence it was preſs'd: But it's in this Abridgment, as it is in Cordial-Waters, we taſt all the Ingredients without being able to ſeparate this from that; but ſtill we find the Virtue of every Plant, in every Drop.*

This Treatiſe having been extreamly well receiv'd, not only in French, *but alſo in* Engliſh, *notwithſtanding the many Errors of the firſt* Tranſlation, *we have adventur'd to publiſh it in a more regular Dreſs, as will eaſily appear to all* Candid Judges: *And to this, we have added an Abridgment of the Famons* VIGNOLA; *That the Lovers and Learners of* ARCHITECTURE, *may have in this* Pocket-Book, *all that belongs both to the* Theory *and* Practice *of that noble Art.*

AN ABRIDGMENT Of the Ten BOOKS of *ARCHITECTURE*, Written by *VITRUVIUS*.

Part I.

Of Architecture *that is common to us with the Ancients.*

CHAP. I.

Of Architecture *in General.*

§. I. ARCHITECTURE is certainly the Ancienteſt of all Arts; for the firſt Benefit Men receiv'd from Society, was the mutual help they afforded one another in *Building Houſes*, to ſhelter themſelves more conveniently than in Caves, or under Trees, where they liv'd before.

§. I. *The Antiquity and Original of* Architecture.

Thoſe Houſes were at firſt little *Huts*, made only of green Turf, and broken Branches of Trees; but, in time, larger, firmer, and more regular Buildings were rais'd; and at laſt all the Ornaments of Edifices Invented: The Pieces of Timber of which the Roofs and Floors of Houſes are made, being the Original of *Pillars*, *Architraves*, *Friezes*, *Triglyphs*, *Mutils*, *Brackets*, *Cornices*, *Frontons*, *Pediments*, &c. which are made of Stone or Marble.

The *Pillars* were made in imitation of Trunks of Trees, and their uſe was taken from the Carpenter's Poſts, that are made to ſupport the Building. The Architraves which are laid acroſs many Pillars, repreſent *Summers*, that joyn many *Poſts* together; The *Friezes* imitate the *Muring*, that is betwixt the ends of the *Beams* that are directly upon the *Pillars*. The *Triglyphs* repreſent the *Cieling*, or Joyner's Work, which was made on the ends of the Beams to preſerve them. The *Cornices* are, as it were, the extream parts of the Joyſts. The *Modillions* repreſent the ends of the Shears; and the *Dentels* the ends of the Principal *Rafters*. The *Frontons* imitate the *Firms* and *Girders*, on which is laid the Roof of the Houſe.

The Ornaments of *Architecture* were found by the Inventers of the ſeveral *Orders*: The firſt Fabrick that was made according to any of the Orders, was the Temple of *Juno*, Built in the City of *Argos*, by King *Dorus*, which was the Origin of the *Dorick* Order. The *Ionians* were the Authors of another Order; which from them was call'd the *Ionick*, according to which they Built a Temple in Honour of *Diana*. This Temple being dedicated to a Deity, whom they repreſented under the Shape of a young Lady; they thought it was proper to make their Pillars more tapering than they are in the *Dorick* Order; the better to repreſent the airy Stature of this Goddeſs; and for this very Reaſon they adorn'd their Pillars more delicately, adding Baſes, which repreſent the Buskin'd Ornaments of the Legs and Feet, according to the Faſhion of thoſe Days; and made the *Channellings* deeper, to repreſent the Foldings and Plaits of a fine light Garment. They put likewiſe *Volutes* or *Scrowls* upon the *Capitals*, in imitation of the Head-dreſs of a Virgin, whoſe Hair deſcending from the top of her Head, was curl'd under each Ear.

Afterwards *Callimachus* an *Athenian*, embelliſhed the Capitals of the Pillars, adding to them more beautiful *Volutes* or *Scrowls*, and more in number, Enriching them with the Leaves of *Brank-Urſine*, and *Roſes*. This Capital, which according to *Vitruvius*, makes all the diſtinction betwixt the *Corinthian* and *Ionick* Order, was Invented by *Callimachus* on this occaſion: Having ſeen the Leaves of the above-mentioned Plant grow round about a Basket which was ſet on the Tomb of a young *Corinthian* Lady, and which, as it happened, was ſet upon the middle of the Plant; he repreſented the Basket by the *Tambour* or *Vaſe* of the *Capital*, to which he made an *Abacus*, to imitate the Tile with which the Basket was covered; and the Stalks of the Plant by the *Volutes* or *Scrowls*, which were ever after plac'd upon the *Corinthian* Capital. See the IX*th*. Plate.

This great Artiſt alſo Invented other Ornaments, ſuch as we call *Ovos*, (or *Eggs*) becauſe of the Ovals in the *Relievo*, which are in the Mouldings of the *Cornices*, and are like *Eggs*. The Ancients call'd this Ornament *Echinus*, which ſignifies the ſharp prickly Shell of Cheſtnutts, becauſe they found theſe Ovals repreſented a Cheſtnut half open, ſuch as it is when it is Ripe.

Vitruvius mentions likewiſe *Hermogenes*, another famous Author, who found out the proportion of all the parts of a Fabrick; and who alſo Invented the *Euſtyle*, the *Pſeudo-diptere*, and all that is Beautiful and Excellent in Architecture.

§. II. *What* Architecture *is.*

§: II. *Architecture* is a Science which ought to be accompanied with the Knowledge of a great many other Arts and Sciences, by which means it makes a juſt Judgment of all the Works of other Arts that appertain to it. This Science is acquir'd by *Theory* and *Practice*. The *Theory* of Architecture is attain'd by *Study*, *Travelling*, and *Diſcourſe*; the *Practice* is gotten by the actual Building of great Fabricks. Theſe two Parts are abſolutely neceſſary to make a *good Architect*.

§. III. *Neceſſary Qualifications of an* Architect.

§. III. But beſides what eſſentially belongs to *Architecture*, there are many other things to be known by an Architect. 1*ſt*. He muſt be able to *Couch in Writing* his intended Building; *Deſign the Plan*, and *make a good Model of it*. 2*dly*. He has occaſion for *Geometry* on many occaſions. 3*dly*. He muſt know *Arithmetick*, to make true Calculations. 4*thly*. He muſt be knowing in Hiſtory, and be able to give a Reaſon of the greateſt part of the Ornaments of Architecture. As for inſtance, if inſtead of Pillars, he ſupport the Floors of the Houſe with the figures of Women, which are call'd *Cariatides*, he ought to know that the *Greeks* Invented theſe Figures, to preſerve the memory of their Victory over the *Carians*, whoſe Wives they made Captives. 5*thly*. He muſt be a good *Moral Philoſopher*; for he ought to have a *great Soul*, and *Spirit*; and be *Bold* without *Arrogance*, *Juſt*, *Faithful*, and altogether *free from Avarice*. 6*thly*. The Architect muſt be *Docile*, and hear the Advice and Opinion not only of the meaneſt Artiſt, but alſo of thoſe who underſtand nothing of Architecture; for all the World are to judge of his Works. 7*thly*. *Natural Philoſophy* is likewiſe neceſſary for him, to diſcover the cauſes of many things which he is to remedy. 8*thly*. He ſhould know ſomething of *Phyſick*, to diſtinguiſh the qualities of the *Air*, and what places are Healthful and Habitable, and what not. 9*thly*. He muſt know *the Laws and Cuſtoms of Places*, for the Building of *Partition-walls*, for *Proſpect*, and for the *Conveying of Waters* and *Sewers*. And 10*thly*. he muſt know *Aſtronomy*, that he may be able to make all ſorts of *Dials*.

It was neceſſary among the Ancients, that an Architect ſhould have Skill in *Muſick*, to ſtring rightly *Catapults*, and other Warlike Inſtruments; and to place muſically Veſſels of Braſs in the Theaters.

§. IV. *Of the parts of* Architecture.

§. IV. Three things ought to be found in all Fabricks, *viz*. *Solidity*, *Convenience* and *Beauty*, which Architecture gives them, by the due *Ordering* and *Diſpoſition* of all the parts of an Edifice; and by a juſt *Proportion*, having regard to a true *Decorum*, and well regulated *Oeconomy*: From whence it follows, that *Architecture* hath Eight parts, *viz*. *Solidity*, *Convenience*, *Beauty*, *Order*, *Diſpoſition*, *Proportion*, *Decorum*, *Oeconomy*.

Solidity depends on the goodneſs of the Foundation; Choice of Materials, and the right uſe of them; *Convenience* conſiſts in ſuch Ordering and Diſpoſition of the parts of an Edifice, that they may not hinder or embarraſs one another. *Beauty* conſiſts in the excellent and agreeable Form, and the juſt Proportion of all its parts.

Order gives all the parts of an Edifice a *convenient Bigneſs*; whether we conſider them apart, or with relation to the whole. *Diſpoſition* is the *due Ranging*, and *agreeable Union* of all the parts; ſo that as *Order* reſpects the *Greatneſs*, *Diſpoſition* reſpects *Form* and *Situation*; which two things *Vitruvius* attributes to *Diſpoſition*, under the Word *Quality*, and oppoſes to *Quantity*, which appertains to *Order*. There are three ways by which the Architect may take a view before-hand, of the Fabrick he is to Build, *viz*. Firſt, *ICHNOGRAPHY*, which is the *Geometrical* Plan; *ORTHOGRAPHY*, which is the *Geometri-*

cal Elevation; and *SCENOGRAPHY*, which is *Perſpective Elevation.*

Proportion, is the Relation that all the Work has with its parts, and which every one has ſeparately to the *Idea* of the whole; according to the meaſure of any part. For amongſt Works that are perfect, from any particular part, we may make a certain Judgment of the Greatneſs of the whole Work: For Example, the Diameter of a Pillar, or the length of a *Triglyph* gives us a right *Idea* of the whole Temple. To expreſs the Relation many things have one to another, as to their Greatneſs or different number of parts, *Vitruvius* indifferently uſes theſe three Words, *Proportion*, *Eurythmy*, and *Symmetry*; but we think it proper only to make uſe of the Word *Proportion*; becauſe the other two are *Greek*, and have not the ſame ſignification in our Language, which *Vitruvius* gives them.

Decorum or *Decency*, is that which makes the *Aſpect* of the Fabrick ſo *correct*, that there appears nothing that is not approv'd of by, and founded upon ſome Authority. It teaches us to have regard to three things, which are, *Deſign*, *Cuſtom* and *Nature*. The Regard to *Deſign* makes us chuſe for Example, other Diſpoſitions and Proportions for a Palace than for a Church. The Reſpect we have to Cuſtom, is the Reaſon, for Example, That the Porches and Entries of Houſes are Adorned, when the inner parts are Rich and Magnificent. The Regard we have to the *Nature of Places*, makes us chuſe different Proſpects for different parts of the Fabrick, to make them the wholſomer and the more convenient: For Example, the *Bed-Chambers* and the *Libraries* are expoſed to the *Morning Sun*; the *Winter* Apartments, to *the Weſt*; the *Cloſets* of *Pictures* and other *Curioſities*, which ſhould always have equal Light, to the *North*.

Occo-

Oeconomy teaches the Architect to have Regard to the Expences that are to be made, and the quality of the Materials, near the Places where he builds, and to take his Meaſures rightly for the Order and Diſpoſition; *viz.* to give the Fabrick a convenient Form and Magnitude.

Theſe five parts, as we have ſaid, have a Relation to the three firſt, *viz. Solidity*, *Convenience*, *Beauty*, which ſuppoſe. *Order*, *Diſpoſition*, *Proportion*, *Decorum* and *Oeconomy*.

CHAP. II.

Of the Solidity *of the Building.*

§. 1. *Of the Choice of Materials. Of* **Stone.**

§. I. THE Materials of which *Vitruvius* ſpeaks, are, *Stone*, *Brick*, *Wood*, *Lime* and *Sand.*

Of *Stones*, ſome are *Soft*, ſome *Harder*, and ſome *extreamly hard*: Soft Stones are good for the inner parts of the Building, where they are cover'd from Rain and Froſt; which would reduce them to Powder; and if they be made uſe of in Buildings near the Sea; the Salt Particles of the Air and Heat deſtroys them. Stones that are indifferently hard, are fit to bear Weight; but ſome of that ſort will eaſily break by the Heat of the Fire. There is alſo a ſort of *Free-ſtone*, ſome of which are *Red*, ſome *Black*, and ſome *White*; which are as eaſily cut with a Saw as Wood.

Of Brick.

The beſt *Bricks* are ſuch as are only Dryed and not baked in the Fire. But many years are required to dry them well; and for that Reaſon a Law was made at *Utica*, a City of *Africa*, that none ſhould make uſe of *Bricks* that had not been made Five Years. For Bricks ſo dryed, were ſo light, and had their Pores ſo cloſe in their Superficies, that they would ſwim on Water like a Pumice Stone. Theſe Bricks were uſually made of a Fat

White chalky Clay without Gravel or Sand, which made them more durable; the Ancients mixt Straw with them, to make them better bound and firmer.

Of Wood. The Wood they made uſe of in Building, was either *Oak*, *Poplar*, *Beech*, *Elm*, *Cypreſs*, *Fir*, &c: of which ſome ſorts are more proper for Building than others. *Fir* having a great plenty of *Air* and *Fire*, and but little *Earth* and *Water*, is therefore light, and does not eaſily bend; but is very ſubject to Worms and Fire. *Oak* is more Earthy, and laſts for ever under ground, but above ground is apt to cleave. *Beech* has little Earth, Humidity and Fire, but great plenty of Air; it is not ſolid, and breaks eaſily. The *Poplar* and *Linden*-Trees are eaſily cut, and therefore only good for light Work, and fitteſt for Carving. The *Alder* is good to make Piles of in marſhy places. The *Elm* and the *Aſh* are *pliable*, and do not eaſily cleave. The *Yoke-Elm* is pliable, and yet very ſtrong; for which Reaſon they made Yokes for Oxen of this Wood. The *Pine* and the *Cypreſs*-Trees, bend eaſily under any Weight; becauſe of their great moiſtneſs: But they have this advantage, that their Humidity does not ingender Worms, becauſe of its bitterneſs. The *Juniper* and the *Cedar* have the ſame virtue of hindring Corruption: The *Juniper* by its Gum, call'd *Sandarax*, and the *Cedar* by its Oyl, call'd *Cedrium*. The *Larch*-Tree, has alſo the ſame Virtue, but its particular Property, is, that it is *Incombuſtible*. The *Olive-Tree* is very ſerviceable in the Foundations, and Walls of Cities, for being ſinged a little, and then interlaid among the Stones, it becomes Incorruptible, and laſts for ever.

Of Lime. *Lime*, is either made of white Stones or Flinty Pebbles; the harder the Stones are which 'tis made of, the better it is for Building. That which is made of ſoft ſpungy Stones is proper for Plaiſtering.

Sand is of five ſorts: *viz. Pit-ſand*, *River-Sand*, *Gravel*, *Sea-Sand*, and *Pozzolana*, which is a *Sand* peculiar to ſome parts of *Italy*. That *Sand* is the *beſt*, which being rubb'd between the hands makes a little noiſe, which that Sand does not that is Earthy, becauſe it is not rough. Another mark of good Sand is, that when 'tis laid upon a thing that is white, and then ſhak'd off, it leaves no mark behind. *Pit-Sand* has all theſe Qualities, and is accounted the beſt. *Vitruvius* diſtinguiſhes it into *White*, *Black*, *Red*, and *Bright like a Carbuncle*. In default of *Pit-ſand*, we may make uſe of *Sea-ſand*, or *River-ſand*, which is likewiſe better for *Plaiſtering*, than the Sand that is dug out of a Pit, which laſt is excellent for *Building*, becauſe it dries quickeſt. *Gravel* is alſo very good, provided the groſſer Parts be taken away. *Sea-ſand* is worſt of all, becauſe 'tis long a drying. The Sand which is found near *Naples*, call'd *Pozzolana*, being mix'd with Lime, not only in ordinary Fabricks, but even in the very bottom of the Sea, grows into a wonderful hard Body, for which reaſon the Ancients made uſe of it for Moles or Peers near the Sea.

§. II. *Of the Uſe of Materials.*

§. II. Before we begin to build, the Stones muſt be expos'd in ſome open Place, after they are dug out of the Quarry, to the end that thoſe that are endamag'd by the Air during this time, may be put in the Foundation, and ſuch as are durable and ſound, may be kept for the Walls above Ground.

The Wood muſt be cut in a ſeaſonable time; that is, in Autumn, and Winter; for then it is not full of that ſuperfluous Moiſture which weakens it, by dilating the Fibres, but is firm, and well clos'd by the Cold. This ſuperfluous Moiſture endamages Trees ſo much, that we are often oblig'd to top the Trees (we deſign for Building) at the Foot; cutting not only the Bark, but even part of the Wood it ſelf, and ſo leave it for ſome time before it be fell'd. It is plain, that the draining of this ſuperfluous Humidity, ſtrengthens the Timber, and hinders Corruption, from this, that thoſe Piles that are ſinged, and then inter-laced among the Stones in the Walls, and Fortifications of Towns, endure for ever.

Bricks ought not to be made uſe of but in very thick Walls. In *Rome*, to ſave Ground, they were not permitted to make the Walls of their Houſes above a Foot and a half thick, (which makes about 16 Inches and a half of our Foot) and therefore they did not build with Brick. They likewiſe never made the top of their Walls with Brick: For the Brick of the Ancients not being baked, this part of the Wall would have been eaſily endamag'd. Therefore they built it with Tiles, a Foot and a half high, comprizing the *Corniſh*, or *Entablature*, which was likewiſe made of Tiles, to caſt off the Water, and defend the reſt of the Wall.

The Walling with Brick was, upon account of it's durableneſs, ſo much eſteem'd among the Ancients, that their Publick Fabricks, and moſt Beautiful Palaces were built with it: And when Architects were appointed by Law to make an Eſtimate of Buildings, if they were of Stone, they always deducted an 80th part of the Building's prime Coſt for every year the Walls had been ſtanding, ſuppoſing they could not endure longer than 80 years. But when they appraiſed Buildings of Brick, they always valued them at what they coſt at firſt, ſuppoſing them to be of an eternal duration.

To make good *Mortar* with *Lime and Sand*, the Lime muſt firſt be well quench'd, and then kept a long time; that if there be any Piece of it that was not well burnt in the Kiln, it may, being extinguiſh'd at leiſure, ſoften as well as the reſt. This is of great Importance, particularly in Plaiſtering and Works of * *Stuck*, which is a Compoſition of Marble finely beaten, and pulveriz'd with

* *Or Plaiſter of* Paris.

with Lime: For if any little Pieces remain that are not well bak'd, when they come to be made uſe of, they crack and break the Work.

In Plaiſtering we muſt not make uſe of Sand that was lately dug out, becauſe it dries the Mortar too faſt, which cracks the Plaiſtering: But if the Sand be for *Maſonry*, it muſt not have been a long time expos'd to the Air; for the Sun and Moon do ſo alter it, that Rain diſſolves it, and turns it almoſt all into Earth.

To make good Mortar, there muſt be three parts of *Pit-ſand*, or two Parts of *River*, or *Sea-ſand*, to one of *Lime*: And 'twill be yet much better if you add to the *River*, or *Sea-ſand*, a third part of Tiles well beaten. The chief thing to be obſerv'd in making Mortar, is to mix it well, and tew it a great while.

§. III. the Foundation.

§. III. The *Foundation* is the moſt important part of the Fabrick; for the faults committed in it, cannot, ſo eaſily, be remedied, as in other Parts.

To lay the Foundation well, you muſt dig till you come to ſolid Ground, and even into the ſolid as much as is neceſſary to ſupport the weight of the Walls: It muſt be larger below than above the ſuperficies of the Earth. When you have found firm Earth, to make it yet more ſolid, you muſt beat it well with a Rammer; but if you cannot come at ſolid Earth, but find it ſtill ſoft and ſpungy, you muſt dig as deep as conveniently you can, and then drive in Piles of Alder, Olive, and Oak, a little ſinged, cloſe together, and fill up the void places between the Piles with Coal. Afterwards, you muſt make the Maſonry with the moſt ſolid Stone that can be found for this uſe: And in the Foundation of great Fabricks, to make the binding of Stones the ſtronger, you muſt drive in Piles of Olive, a little ſinged, and plac'd very thick, from one Parement or Courſe to another, which ſerves, as it were, for Keys and Braces.

When you would make Cellars, the Foundations muſt be much larger; for the Wall that is to ſupport the Earth requires a greater thickneſs to reſiſt the ſtrong Efforts the Earth makes againſt it in Winter; at which time it ſwells, and becomes more heavy, by reaſon of the Water that it has imbibed.

§. IV. Of the Walls.

§. IV. The right ordering of Stones joined with Mortar, which is call'd *Maſonry*, is ſeven fold: Three ſorts of *Maſonry* are of hewed Stone, *viz.* That which is in form of a *Net*; that which is *Bound* and that which is call'd the *Greek Maſonry*. There are alſo three ſorts of *Maſonry* of unhewed Stone, *viz.* that which is of an *equal Courſe*, that which is of an *unequal*, and that which is fill'd up in the middle; the ſeventh is compounded of all the reſt.

Net-Maſonry.

Net-Maſonry is made of Stones perfectly ſquared in their Courſes, and are laid ſo, that the Joints go obliquely, and the *Diagonals* are the one *Perpendicular*, and the other *Level.* This Maſonry is the moſt pleaſing to the Sight, but is apt to crack. *See Figure* A. *Plate* I.

Bound-Maſonry.

Bound-Maſonry, as *Vitruvius* explains it, is that in which the Stones are plac'd one upon another like Tiles; that is to ſay, where the *Joints* of the Beds are *Level*, and the *Mounters* are *Perpendicular*; ſo that the Joint that mounts and ſeparates two Stones, falls directly upon the middle of the Stone which is below. Some Authors call this ſort of Maſonry *Incertain*, Reading, thro' miſtake, *Incerta*, inſtead of *Inſerta*; it is not ſo beautiful as the Net-work, but it is more ſolid and durable. *See Figure* BB. *Plate* I.

Greek Maſonry.

The Maſonry, which *Vitruvius* ſays is particular to the *Greeks*, is that, where after we have laid two Stones, each of which make a Parement, or *Courſe*, another is laid at the end, which makes two Parements or *Courſes*, and all the Building through obſerve this Order. This may be call'd

Double-Binding; for the Binding is not only of Stones of the ſame *Courſe* one with another, but likewiſe of one *Courſe* with another Courſe. *See Figure* CC. *Plate* I.

The manner of Walling by unequal Courſes call'd *Iſodomum* by the Ancients, differs in nothing from the *Bound-Maſonry*, but only in this, that the Stones are not hewed. *See Fig.* D. *Plate* I.

The other Manner by unequal Courſes call'd *Pſeudiſodomum*, is alſo made of unhew'd Stones, and laid in *Bound-Work*; but they are not of the ſame thickneſs, and there is no equality obſerv'd, but only in the ſeveral Courſes; the Courſes themſelves being unequal one to another. *See Fig.* A. *Plate* I.

The Maſonry fill'd up in the middle, call'd by the Ancients *Emplecton*, is alſo made of unhewed Stone, and by Courſes; but the Stones are only ſet in order as to the *Parements*, or *Courſes*, but the middle is fill'd up with Stones thrown in careleſly among the Mortar. *See Fig.* FF. GG. H. *Plate* I.

Of all the ſorts of Maſonry, that will ever be beſt, which is made of Stones of an indifferent ſize, rather leſs than greater, to the end that the Mortar penetrating them in more parts may bind them faſter, and the ſtrength of the Mortar, not ſo ſoon decay. For we ſee that the Mortar which is laid in the Joints of the greater Stones, in time turns to Duſt, which never happens, in the moſt ancient Fabricks that have been built of little Stones. So that it is plain, that 'tis ill Husbandry to be ſparing of Mortar. For this reaſon, *Vitruvius* propoſes a Walling, which may be call'd, *the Compound Maſonry*, and the Structure of which is as follows: The *Courſes* being made of hewed Stone, the middle place which was left void, is fill'd up with Mortar and Pebbles thrown in together: After this, they bind the Stones of one *Parement* or Courſe to thoſe of another with Cramp Irons faſten'd with melted Lead. *See Fig.* K. *Plate* I.

Compound Maſonry.

In great and heavy Buildings, the inner part of the Wall may be ſtrengthened with long Piles of ſinged Olive, which ſerves for Keys and Braces. It is alſo of great importance for the ſtrength of Walls, that all be directly perpendicular, and that the *Chains*, the *Pillars*, and *Peers* be ſo ſituated, that *Solid* always anſwer to *Solid*; for if any part of the Wall, or any Pillar carries falſe, the Work cannot continue long.

There are likewiſe two ways of ſtrengthening the Walls, *viz.* either by eaſing them of their own *Weight*, or of that of the Earth which they are to ſupport. The firſt way of eaſing the Wall is in void Places; as above Doors, and Windows, which is done either by putting over the Lintel which ſupports the Wall that is over the void ſpace, two Beams which reſting below directly upon *Peers* meet together above: Or by making directly over the void Spaces, Vaulted Arches with Stones cut Corner ways, and tending to one Center. The ſecond way of eaſing the Wall is by *Buttreſſes*, which not only ſupport it, but likewiſe reſiſt and leſſen the Efforts and Swelling of the Earth.

§. V. of *Flooring, and Cieling.*

§. V. There are four ſorts of *Flooring*: Some are upon the Superficies of the Ground, others between two Stories; ſome make the Roof of the Platform; and the laſt is the *Flat-Roof*, or *Cieling* properly ſo call'd.

To make Floors on the Ground, you muſt firſt make the Earth ſmooth and plain, if it be firm, and ſolid; if not, it muſt be beaten with a Rammer. After that, the Ancients having cover'd the Earth with a Lay of flinty Stones, of the bigneſs of one's Fiſt, among which was mix'd Mortar; they laid the ſecond Bed made of leſſer Stones.

The *Greeks* to make Floors in low moiſt Places, digg'd the Earth two Foot deep; and having beaten it well, they laid a Bed of Mortar or Cement a little ſloping from either ſide to the

Channel, which convey'd the Water under Ground; They laid a Bed of Coal upon the firſt Mortar, and having beaten them well, they cover'd them with another Cement made of Lime, Sand, and Aſhes, which they ſmoothed when dry, with a poliſhing Stone. Theſe Floors preſently drank up the Water that was ſpilt upon them; ſo that one might walk on them barefoot, without being incommoded by the Cold.

In making Floors between two Stories, care muſt be firſt taken, that if there be any Partition below, it may not touch the Flooring, leſt if the Flooring came to ſink a little, it might be broke upon the Partition that remains firm. To make theſe Floorings, the Boards muſt be nail'd at each end upon every Joiſt, to keep them from Warping: Theſe Boards being cover'd with Straw, to hinder the Timber being waſted by the Lime, the firſt Bed muſt be laid, made of a Mixture of Mortar, and Pebbles, which muſt be beaten a long time with Iron Levers; and ſo it muſt make a ſolid Cruſt nine Inches thick. Upon this Cruſt ſhall be laid another Bed of Cement, which muſt be at leaſt ſix Inches thick. On this ſecond Lay is placed the *Pavement* made with the Rule, afterwards it muſt be ſcrap'd, and all the inequalities taken away: And laſtly, there muſt be laid a Compoſition of Lime, Sand, and beaten Marble, to fill equally all the Seams, or Joints.

To make a *Cieling* or *Flat-Roof* in the form of a Vault, you muſt nail to the Joiſts of the Boards, or to the Rafters of the Roof, at two Foot diſtance one from another, pieces of crooked Timber; and choice muſt be made of Timber that is not apt to rot, *viz.* *Cypreſs*, *Box*, *Juniper*, and *Olive*. No *Oak* muſt be made uſe of, becauſe it will Warp and Crack the Work. The *Joiſts* being faſten'd to the *Summers*, you muſt fix to them *Spaniſh Broom*, with *Greek Reeds* well beaten; which Reeds are inſtead of Laths. Over theſe Reeds muſt be laid a Plaiſter of Mortar made of Sand, to hinder the drops of Water which may fall from above from endamaging theſe *Cielings*. After which, the under-part muſt be plaiſter'd pretty thick; making all Places equal with Mortar made of Lime and Sand, which is afterwards to be ſmoothed with Mortar made with Lime, and Marble, which we now call, *Plaiſter of Paris*.

The *Corniſhes* that are made uſe of under the *Cielings*, ought to be little, leſt their great jetting out ſhould make them heavy, and apt to drop. For this reaſon they ought to be made of pure *Stuck of Marble*, without any Plaiſter, that all the Work drying at the ſame time, may be leſs apt to break.

§. VI. Of *Plaiſtering*.

§. VI. To make *Plaiſter* that may laſt a long time, and not crack, you muſt lay it on Walls that are very dry; for if the Walls be moiſt, the *Plaiſtering* being expos'd to the Air, and drying faſter than the Walls, will therefore crack. The better to do this, the *Plaiſtering* muſt be laid, Bed after Bed, taking great care not to lay the ſecond Bed till the firſt be almoſt dry, and ſo forth: The Ancients put ſix Lays, 3 of Mortar made of Lime, and 3 of Stuck. The firſt Beds were always thicker than the laſt, and they were very careful to make uſe of no Mortar made either of *Sand*, or *Stuck* in their Plaiſtering, that had not been well beaten and mix'd together, eſpecially the *Stuck*, which muſt be beaten and tew'd till it will not ſtick to the Trowel. They alſo poliſh'd the Plaiſter ſo well, that it ſhined like Glaſs.

Theſe Plaiſterings ſerve to paint in *Freſco* upon; for the Colours being laid on the Mortar before it was quite dry, penetrated it, and embodied with it; ſo that the Painting could not be defac'd, tho' it were waſh'd; but it would eaſily be waſh'd off, if the Mortar were dry.

CHAP.

CHAP. III.

Of the Convenience of Fabricks.

§. I. Of the Convenience of Buildings. Plentifulneſs of the Place.

§. I. THE *Convenience* of the place where the Fabrick is to be built, is one of the principal Things the Architect ought to conſider. Therefore to build a City, we muſt chuſe a place that is fertile, and has Rivers or Ports capable of furniſhing it with the Product and Commodities of the adjacent Countries.

Wholſomneſs of the Air.

In the next place, the Wholeſomneſs of the Air muſt be regarded: And to this end we muſt chuſe a high ſituated place, that it may be leſs ſubject to Fogs and Miſts; it muſt be likewiſe far from all Moraſſes, becauſe the Corruption that may be occaſion'd by the infectious Breath of Venomous Creatures, which commonly are ingendred there, makes the place very unwholſom; unleſs theſe Moraſſes be near the Sea, and ſituated high, that the Water may fall eaſily from them into the Sea, and that the Sea may likewiſe ſometimes overflow them, and by its Saltneſs deſtroy all the Venomous Creatures.

It is likewiſe to be remark'd, That a City ſituated upon the Sea, muſt needs have an unwholſom Air, if it be towards the South or the Weſt; for generally the Heat weakens Bodies, and the Cold ſtrengthens them; and ſo we ſee, by Experience, that thoſe who go out of a Cold Country into an Hot, do ſeldom enjoy their Health; whereas the contrary happens to the Inhabitants of hot Countries, who remove into colder Climates.

To judge of the Quality of the Air, Water, and Fruits of any place, the Ancients conſulted the Entrails of the Beaſts that liv'd there; for if their Liver was corrupted, they concluded that the ſame Thing muſt happen to Men that ſhould inhabit that place.

§. II. *Of the Form and Situation of the Building.*

§. II. Having choſen a wholſom, convenient, and plentiful Place, the Streets muſt be laid out according to the moſt advantageous Aſpect of the Heavens, and in ſuch a manner that the predominant Winds may not come directly into them.

The Proſpect of private Mens Houſes is more or leſs agreeable and commodious, by the Openings that are differently made to receive the Air, or the Light.

Cellaris, *Granaries*, and in general all places that we would lock up and preſerve any thing in, ſhould be expos'd to the North, and receive very few Rays of the Sun.

The *Dining-Rooms* for Winter, and the *Baths* among the Ancients, were always expos'd to the Weſt, for that ſituation made them warmer; becauſe the Sun ſhone upon them about the time they were wont to make uſe of thoſe Apartments.

The *Libraries* muſt be turn'd to the Riſing Sun, becauſe we generally ſtudy in the Morning; beſides the Books are not ſo much damnified by mouldineſs in Libraries ſo ſituated, as in thoſe that are turn'd to the South and Weſt.

The *Dining-Rooms* for the Spring and Autumn, ſhould be turn'd towards the Eaſt, that being cover'd from the great force of the Sun when it is near Setting, they may be cooler about the time they are to be made uſe of.

The *Summer-Apartments* muſt be expos'd to the North, that they may be *freſher and cooler*. This Situation is alſo very proper for *Cloſets for Pictures*, for the North-light which is always equal, repreſents the Colours always alike.

We muſt alſo have great regard to the difference of Climates, for the Exceſs of Heat and Cold require different Situations and Structures. The Houſes in the Northern Parts of the World ought to have great Openings, and be expos'd to the North.

§. III. The *Diſpoſition* of Fabricks contributes much to their Convenience; that is, when every thing is in a proper place, for the uſe the Fabrick is made for. Thus the Town-Houſe and Market-Place ought to be in the middle of the City, unleſs there be a Port, or a River; for then the Market ought not to be far diſtant from thoſe Places, where Commodities are brought on Shoar.

§ III. Of *the Diſpoſition of* Fabricks.

Publick-Houſes.

Private-Houſes ought to be differently diſpos'd, according to the divers Conditions of thoſe that dwell in them. In *Great Men's Houſes*, the Apartments of the Lord muſt not be near the Entry, where ought to be nothing but *Porticos*, *Courts*, *Periſtyles*, *Halls*, and *Gardens*, to receive thoſe who make their Court to them. *The Houſes of Traders* ought to have their *Shops* at the Entry, and behind thoſe their *Magazines*.

Private-Houſes.

Country-Houſes ought to have a different Diſpoſition from thoſe of the City; for the Kitchen ought to be near the Ox-houſe, ſo that from their Cratches the Oxen may ſee the Chimney, and the Riſing-Sun; for this makes them look more beautiful, and renders their Coat ſleek and ſmooth. The *Baths* ought likewiſe to be near the Kitchen, that the Water may be more conveniently heated: Neither ought the Preſs to be far from the Kitchen; and near the Preſs you muſt place the Cellar, whoſe Windows ought to look into the North, becauſe Heat ſpoils the Wine. On the contrary, the place where the Oil is kept, ought to look towards the South, that the gentle Heat of the Sun may keep the Oyl from freezing.

Country-Houſes.

Houſes for Sheep and Goats ought to be ſo large, that each of theſe may at leaſt have Four Foot for his Place. The Stables for Horſes muſt alſo be built near the Houſe in a warm place, but not turn'd towards the Chimney; for Horſes that often ſee the Fire, are generally ill Coated. As for *Barns*, *Granaries*, and *Mills*, they muſt be at a convenient diſtance from the Houſe, becauſe of the danger of Fire.

The principal Care an Architect ought to take is, that the Fabricks be well lighted; and particularly, the *Stair-Caſes*, *Paſſages*, and *Dining-Rooms*.

§. IV. *Of the* convenient Form of *Buildings. Fortifications.*

§. IV. Being aſſured of the Convenience of the Place, where the City is to be built, care muſt be taken of its Fortifications, which do not only conſiſt in the ſtrength of the Walls and Ramparts, but chiefly in their Forms.

The Figure or Form of a Place, ought neither to be Square, nor compos'd of too acute Angles; but it mnſt have a great Number of Corners, that the Enemy may be diſcover'd from all Parts. For acute and far-advanced Angles are not eaſily defended, and are of more advantage to the Beſiegers than the Beſieged. The Approach to the Walls muſt be made as difficult as poſſible.

Publick Places.

The moſt convenient Form of Publick Places, is to have two Thirds of their Length in their Breadth. The *Greeks* made *Double-Porticos* about their Publick Places, with Pillars cloſe together, which ſupported the Galleries above: But the *Romans* finding this great Number of Pillars inconvenient, placed them at a greater diſtance one from another, that their Shops might be well lighted. The *Stair-Caſes* of all Publick Buildings ought to be large and ſtrait, and to have many Entrances to avoid Crowding.

Halls.

The *Halls* where great Aſſemblies are to be kept, ought to have lofty Cielings; and to give them their true Proportion, we muſt put together the length and breadth of the Hall, and allow the half of the whole for the height of the *Cieling*.

In Vaſt and Lofty Places, to remedy the inconvenience of the noiſy Eccho, a *Corniſh* muſt be made round about the middle of the height of the Wall, VVall, to break the Run of the Voice; which without that, having once beaten againſt the VValls, would beat a ſecond time againſt the *Cieling*, and ſo make a troubleſome *Double-Eccho.*

CHAP. IV.

Of the Beauty *of Buildings.*

§. I. *Wherein the Beauty of Buildings conſiſts.*

§. I. BUildings, like Faces, may be ſaid to have two ſorts of *Beauty*; the one *Poſitive*, the other *Arbitrary*. *Poſitive Beauty* pleaſes of it ſelf; *Arbitrary Beauty* pleaſes only from the Circumſtances that accompany it.

Poſitive Beauty.

Poſitive Beauty conſiſts chiefly in three Things: Firſt, in the Equality of the Relation that the Parts have one to another, which is call'd *Symmetry*. *2dly*, In the Richneſs of the Materials: And, *3dly*, In the Neatneſs and Exactneſs of the Performance. As to the firſt, *Vitruvius* has not ſpoke of it, but only where he prefers the *Netway* of Walling before all other ſorts of Maſonry, becauſe of the Uniformity that is in that Figure, and the laying of the Stones. As to the Richneſs of the Materials, he leaves that to him at whoſe Expence the Fabrick is rais'd: And owns that the Beauty of the Performance depends altogether on the Skill and Induſtry of the Workmen.

Arbitrary Beauty.

Arbitrary Beauty, is of two ſorts; the one is call'd *Wiſdom*, the other *Regularity*. *Wiſdom* conſiſts in the reaſonable uſe of *Poſitive Beauties*, that reſult from the convenient ordering of the Parts, for the perfection of which an equal, correct, and uniform Figure ought to be given to a Rich Material. Of this Perfection *Vitruvius* gives us two Examples. The Firſt is, when *Boſſes*, or *Relievo's* are made to hide the Joynts, putting them direct-

Wiſdom.

ly under the *Boſſes*, which yields an agreeable ſight. The Second is, in Relation to VVinter Apartments, in which we ought to take care that the Cieling have little or no Carving; and that the Ornaments be not made of *Stuck*, both which would be eaſily tarniſh'd by the ſmoak of the Fire and Candles, and the Filth would ſtick, and enter into the Creviſſes of the Carving, which no wiping could fetch out.

Regularity.

Regularity depends on the Obſervation of the Laws eſtabliſh'd for the Proportions of all the Parts of *Architecture*; and which pleaſe all Lovers of this noble Science upon theſe two Motives: Firſt, becauſe for the moſt part they are founded upon Reaſon, which requires, for Example, that the Parts that ſupport and are under, be ſtronger than thoſe above; Thus *Pedeſtals* are broader than the *Pillars* they ſupport, and theſe again broader at the bottom than the top. The other Motive is *Prepoſſeſſion*, which is the moſt uſual Foundation of the Beauty of all Things: For as we admire the Court faſhion in Cloaths, not becauſe that Mode has any *Poſitive Beauty*, but only for the *Suppoſed Merit* of thoſe that follow it; ſo we are enclin'd and accuſtomed to love the Proportions of the different Members of Architecture, rather from the good Opinion we entertain of thoſe that invented them, than for any *Poſitive Beauty* which is found in the Works of the Ancients: For oftentimes theſe Proportions are contrary to Reaſon; as for inſtance, in the *Thorus* of the *Ionick Baſe*, and in the *Faces* of *Architraves*, and *Chambranles*, or *Door Caſes* with their *Mouldings*, where the Weak ſupports the Strong.

Proportions.

Theſe Proportions belong to three principal Members, *viz.* *Pillars*, *Pediments*, and *Chambranles*. The *Pillars* taken generically, and as oppoſite to *Pediments*, and *Chambranles*, or *Door-Caſes*, have three Parts, *viz.* the *Pedeſtal*, the *Pillar*, and the *Ornaments*. Every one of theſe Parts is ſubdivided into three other Parts; for the *Pedeſtal* has its *Baſe*, *Die*, and *Corniſh*; the *Pillar* comprehends it's *Baſe*, *Shaft*, and *Capital*; and the *Ornaments* conſiſt in the *Architrave*, *Frieſe*, and *Corniſh*.

Acroteres.

The *Pediement*, or *Fronton*, has alſo three Parts, *viz.* the *Tympan*, the *Corniſhes*, and the *Acroteres.* The *Chambranle*, or *Door-Caſe*, has two *Peers*, and the *Lintel*, which likewiſe ſupports the *Frieſe*; and this has alſo a *Corniſh*.

Gender.
Order.

The *Diſpoſition*, *Form*, and *different Properties* of all the Parts, make *Gender*, and *Order*, to which all that is beautiful in Building has a Relation. *Gender* depends on the Proportion that is between the *Thickneſs* of the Pillars, and their *Height*. But we likewiſe comprehend under this Proportion many other Things that belong to the principal Parts of Pillars, and other Things which differ, according to the different *Orders*, ſuch as are *Gates*, *Door-Caſes*, &c.

§. II. *Of the* **Five** *ſorts of* **Fabricks.**
Pycnoſtyle.

§. II. There are Five ſorts of Fabricks; The Firſt is called *Pycnoſtyle*, viz. where the *Pillars* are very cloſe one to another, in ſuch a Proportion that from one Pillar to another, there is but the ſpace of a Diameter and half of the Pillar. See Fig. AA. Plate II.

Syſtyle.

The Second is called *Syſtyle*, viz. where the Pillars, tho' they ſeem to be joined together, are nevertheleſs a little more diſtant one from another than in the *Pycnoſtyle*; for the *Intercolumnation* is two Diameters of the Pillars. The Defect that is obſerv'd in the *Syſtyle*, as well as in the *Pycnoſtyle* is, that the Entrance of the Fabricks which are placed in that diſtance are very narrow: So that *Vitruvius* remarks, that the Ladies as they walk'd to the Temple hand in hand, were forc'd to part when they came thither, becauſe they could not go two a-Breaſt between the Pillars. See Fig. BB. Plate II.

Diaſtyle.

The Third is called *Diaſtyle*; *viz.* where the Pillars are further diſtant, the ſpace of the *Inter-*

columnation being three Diameters; and here the Inconvenience is, that the ſpace is ſo great, that the *Architraves* which lie upon the two Pillars are in danger of breaking; becauſe the Ancients made them of one Stone. See Figure CC. Plate II.

Areoſtyle. The Fourth is called *Areoſtyle*; *viz.* where the Pillars are ſet very thin. Here is no certain Proportion, but the diſtance of one Pillar from another, is much greater than that of the *Diaſtyle*; and for this reaſon it can have no *Architrave* but of Wood. See Figure DD. Plate II.

Euſtyle. The Fifth is called *Euſtyle*, *viz.* where the Pillars are diſtant from one another by a more convenient Proportion than in any of the other kinds. This diſtance conſiſts of two Diameters of the Pillars, and one fourth part of the Diameter. It has alſo this in particular, That the *Intercolumnation* in the middle is larger than the reſt, having three Diameters of the Pillars; for this reaſon it ſurpaſſeth all others in Beauty, Solidity, and Convenience. See Plate III.

The Eſſentials of theſe Five Kinds, conſiſt in the Proportion between the Diameter of the Pillar, and its *Intercolumnation*: But they are alſo different by the Proportion that is between the Diameter of the Pillar, and its height; for the *Genders* or Sorts, in which the Pillars are cloſe one to another, ought to have the leſſer Pillars; and in that kind, where the Pillars are in a greater diſtance one from another, they ought to be bigger. However, theſe Proportions are not always obſerv'd, and very often, to the *Ionick* and *Corinthian* Pillars, which are the ſmalleſt of all, *Intercolumnations* are allow'd, which are proper to thoſe of the *Tuſcan Order*, where the Pillars are biggeſt. But the Ordinary Practice is, to give the Pillars of the *Areoſtyle* kind, the Magnitude of the 8th part of their height. As to the *Diaſtyle* and *Euſtyle*, the height is divided into Eight parts and an half, to allow one to the breadth. In the *Syſtyle* Kind, the height is divided

ded into Nine parts and an half, and one is given to the thickneſs. In the *Pycnoſtyle*, the thickneſs of the Pillar is the 10th part of the height, the reaſon of which different Proportions is founded upon this, that theſe Pillars ſeem to loſe of their thickneſs according to their height; and it's likewiſe for this Reaſon, that it is thought convenient to have the Pillars in the Corners thicker by a 50th part. See Plat. II. and III.

§. III. Of *the* Five Orders *of* *Architecture.*

§.III. The Five Orders of Architecture are, the *Tuſcan*, the *Dorick*, the *Ionick*, the *Corinthian*, and the *Compound* or *Compoſite*. Theſe Orders were invented to anſwer the Deſign of making Fabricks more or leſs Maſſy, and more or leſs Adorn'd; for the diſtinction of theſe Orders conſiſts in two things, that as the *Tuſcan* and *Dorick* Orders are more maſſy and leſs adorn'd, ſo the *Corinthian* and *Compound* are ſlenderer and Richer. The *Ionick* holds the Middle, as well in its Proportions, as its Ornaments, being leſs maſſy snd more adorn'd than the *Tuſcan* and the *Dorick*, and more maſſy and leſs adorn'd than the *Compound* and the *Corinthian*.

Tho' *Vitruvius* has only divided Architecture into Three Orders; *viz*. The *Dorick*, the *Ionick*, and the *Corinthian*; yet he doth not forget to give the Proportions of the *Tuſcan*, and ſpeaks likewiſe of the *Compound*.

§. IV. Of Things common to *ſeveral* *Orders.*

§. IV. Before we treat of the Differences of theſe Five Orders, it will be proper to ſpeak of thoſe Things that are common to ſeveral Orders; as are the *Steps*, *Pedeſtals*, the *Diminution of Pillars*, their *Channelling*, *Pediments*, *Cornices*, and *Acroteres*.

Steps.

The *Steps* before the Temple ought always to be of an odd Number, to the end, that having ſet the right Foot in mounting the firſt *Step*, it may likewiſe be upon the laſt. They ought not to be more than 6 Inches 10 Lines high, nor leſs than 6 Inches. Their breadth ought to be proportion'd to their height, and this Proportion ought to be of 3 to 4; ſo that if the *Steps* be 6 parts high, which is 3 times 2, they muſt be 8 broad, which is 4 times 2; following the Proportion of a Triangular Rectangle invented by *Pythagoras.*

Landing-Places.

The *Landing-Places* ought not to be narrower than 16 Inches and an half, nor broader than 22 Inches, and all the *Steps* that are round about a Fabrick ſhould be all of the ſame breadth.

Pedeſtals.

The *Pedeſtals* which ſupport many Pillars of the ſame Rank, will be much handſomer if one make them jet out before every Pillar like a Joynt-Stool; for otherwiſe, if the *Baſes* were all of one ſize, they would reſemble a Channel.

Leaning-Places.

If *Leaning*, or Elbow places are to be betwixt the *Pedeſtals*, it's neceſſary that they be as high as the *Pedeſtals*, and that the *Cornices* of the *Pedeſtals*, and of the Leaning-places be equal, and have a true Proportion one to another.

Diminution of Pillars.

All the Pillars ought to go diminiſhing towards the top, both to encreaſe their ſtrength, and render them more beautiful, imitating the Bodies of Trees, which are bigger at the Bottom than at the Top. But this *Diminution* muſt be leſſer in the great Pillars which have their higheſt part further from the Sight, and which by Conſequence makes them ſeem leſſer at the top, according to the ordinary Effect of Perſpective.

The Rule of this different *Diminution* is, that a Pillar that is 15 Foot high, ought to have in the upper part 5 parts of 6, into which the Diameter of the *Baſe* of the Pillar is divided; that which is from 15 to 20 Foot, ought to have 5 and an half of the 6, and an half of the Diameter; that which is from 30 to 40, muſt have 6 and an half of 7, and an half of the Diameter; that which is from 40 to 50, muſt have 7 or 8 of the Diameter. Theſe *Diminutions* do not belong to the

Tuſcan Order, whoſe Pillars are much more diminiſhed; as we ſhall ſhew hereafter.

Beſides this *Diminution* towards the top, there is another below, which makes the Pillar about the middle ſwell like a Belly; the meaſure of this ſwelling is taken from the magnitude which makes up the diſtance between the *Channels.*

There is another ſort of *Diminution of Pillars*, which is of one Pillar in reſpect of another: It is of 2 ſorts, *viz.* when a ſecond rank is placed upon the firſt, for then the ſecond Pillar muſt be a fourth part leſſer than thoſe below; or when *Porticos* are made that have Pillars in the Corners, for thoſe in the middle muſt be leſs than thoſe in the Corners, a 50th part.

Channellings.

The *Channellings* are ſo called, becauſe they are as it were *Demi-Channels*, which deſcend from the top of the Pillar to the bottom; they repreſented the Plaits of the Garments of Women, which the Pillars reſembled, as was ſaid before.

There are three ſorts of *Channellings*, the two firſt are particular and proper to the *Dorick Order*; the third is common to the *Ionick*, *Corinthian*, and *Compound*: The two firſt are more plain and ſimple, and fewer in number than the others.

The moſt Simple is that which is not hollowed at all, and which hath only *Pans* and *flat Fronts* or *Faces.*

The other is a little hollowed; to make this hollowneſs, a Square muſt be made, whoſe Side muſt be equal to the *Pan*, in which the *Channelling* is to be made; and having ſet one Foot of the Compaſs in the middle of the Square, draw a crooked Line from one Angle of the *Channelling* to the other: Both theſe *Channellings* are made up to the number of Twenty.

The other Orders have 24, and ſometimes 32, when it is deſign'd to make the Pillars ſeem greater than they are; for the Eye judgeth things to be greater when they have more and different Marks, which lead, as it were, the Sight to more Objects at once.

Theſe *Channellings* are deeper than thoſe of the *Dorick Order*, and the depth ought to be juſt ſo much, that a Carpenter's Rule being put into the Cavity, it touches with its Angle the bottom, and with it's ſides the two Corners of the *Channelling*. *Vitruvius* hath not taught us the Proportions of the *Channelling*, in reſpect of the *Fillet* which makes up the ſpace between the *Channellings*, nor what the breadth of the *Fillet* ſhould be, which he hath eſtabliſh'd for the Rule of the ſwelling Belly of the Pillar.

Pediement. The *Pediement* is compoſed of a *Tympan* and *Cornices*; to have the true height of the *Tympan*, we muſt divide the breadth which is between the two ends of the *Cymatium* of the *Larmier*, or *Drip* which ſupports the *Pediement*, into 9 parts, and give one to the *Tympan*.

Corniſh. The thickneſs of the *Cornice* being added to this 9th part, makes up the height of the whole *Pediement* or *Fronton*.

Tympan. The *Tympan* ought to be Perpendicular upon the *Gorge* of the Pillar, the things that are common to all *Cornices* are, that the *Cornice* of the *Pediement* muſt be equal to that below, excepting the laſt great *Cymatium*, which ought not to be upon the *Cornice* below the *Pediement*; but it ought to go over the *Cornices* which are ſloping upon the *Pediement* or *Fronton*.

This great *Cymatium* ought to be an 8th part higher than the *Crown*, or *Drip*, or *Larmier*.

In places where there are no *Pediements*, in the great *Cymatiums* of the *Cornices*, muſt be cut the Heads of Lions, at ſuch a diſtance, that there muſt be one directly upon every Pillar, and that the other anſwer directly upon the Covering of the Houſe. Theſe Heads of Lions are pierced through to convey the Water which falls from the Roof upon the *Cornice*: The Heads of the Lions which are not directly upon the Pillars, ought not to be bored through, to the end that the

Water may flow with the greater impetuoſity through thoſe, which are directly upon the Pillars, and that it may not fall between the Pillars upon thoſe who are to go into the *Porticos.*

The *Greeks* in their great Buildings never put any *Dentels* under the *Modillions*, becauſe the *Rafters* could not be under the *Sheers*; and it is a great fault that That, which according to the true Rules of Building ought to be placed above, ſhould be placed under in the Repreſentation. For this Reaſon, the Ancients never approved of *Modillions* in the *Pediements*, nor of *Dentels*, but only ſimple *Cornices*; for neither the *Sheers*, nor the *Rafters* can be repreſented in the *Pediements*, out of which they cannot jet, but only directly out of the Eaves of the Houſe upon which they lie ſloping.

Acroteres.

The *Acroteres* are three *Pedeſtals*, which are upon the Corners and Middle of the *Pediement* to ſupport Statues; thoſe of the Corner ought to be as high as the Middle of the *Tympan*; but the *Acrotere* in the middle ought to be higher by an 8th part than the other.

All the Members or Parts which ſhall be placed upon the Capitals of Pillars, *viz. Architraves*, *Frieſes*, *Cornices*, *Tympans*, and *Acroteres*, ſhould encline forward the 12th part of their height. There is likewiſe another General Rule; which is, that all the Parts that jet out, ſhould have their Projecture equal to their Height.

§. V. Of *the* Tuſcan *Order.*

§. V. We have ſaid that all Buildings have three parts, which may be different according to the divers Orders, *viz.* The *Pillars*, the *Pediements*, and the *Chambranles*, or *Door-Caſes*; and that the *Pillars* had three Parts, which are the *Pedeſtal*, the *Shaft*, and its Ornaments, *viz.* The *Architrave*, the *Frieſe*, and the *Cornice.*

Neither the Proportion of the *Pedeſtals*, nor of the *Gates* and *Chambranles* of the *Tuſcan Order* are to be found in *Vitruvius.*

The

Pillar. The Proportion of the *Pillar* is this, That its thickneſs below is the 7th part of it's height; its Diminution is the 4th part of the Diameter of the *Pillar*; its *Baſe* has half the Diameter of the *Pillar* for its height, the *Plinthus* being round, makes one half of the *Baſe*; the other half is for the *Thorus*, and for the *Conge* or *Apophygis*, Vid. *Conge* explained.

Capital. *Abacus.* The height of the *Capital* is half the Diameter of the Pillar; the breadth of the *Abacus* is equal to the whole Diameter of the Pillar at the bottom; the height of the Capital is divided into 3 Parts; one of them is allowed for the *Plinthus*, which ſerves inſtead of an *Abacus*; the *Echine* hath another; and a third part is for the *Gorge* of the Capital comprehending the *Aſtragal*, the *Conge*, or *Apophygis*, which are immediately under the *Echine*.

Upon the Pillars muſt be laid the *Sabliers*, or *Wooden Architraves*, joined together by *Tenons*, in the form of a Swallow-Tail.

Theſe *Sabliers* ought to be about an Inch diſtant one from another; for if they ſhould touch one another, the Timber would heat and corrupt.

Upon theſe *Sabliers* which ſerve for an *Architrave*, muſt be built a little Wall, which ſerves inſtead of a *Frieſe*.

The *Cornice* which is laid upon this little Wall or *Frieſe*, has *Mutils* which jet out.

All the *Crowning* ſhould have the 4th part of the height of the Pillar. The little Walls that are built between the ends of the Beams which reſt upon the Pillars, muſt be garniſhed and covered with Boards, which muſt be nailed upon the ends of the Beams.

Pediement. The *Pediement*, which may be either of Stone or Wood, and which muſt ſupport the *Top*, the *Sheers*, and the *Pans*, has a particular Proportion; for it muſt be much raiſed to give it a ſuf-

ſicient

ficient ſloping for the running of the Water. See Plate V.

§. VI. *Of the* Dorick *Order.*

§. VI. The *Dorick* Pillar has often chang'd its Proportions; for at firſt it had only for its height 6 times its Diameter; this Proportion imitating that of Humane Bodies, in which the length of the Foot is the 6th part of all the Body; afterwards they allowed 7 times its Diameter.

But this Proportion which the Pillars of *Temples* had at the Beginning, was afterwards changed in that of the *Theatres*, where they were higher by half a Diameter; for they made them 15 Modules, or Models high; Now in the *Dorick Order*, the Semi-Diameter of the Pillar at the bottom is the Module, which in other Orders is a whole Diameter.

The *Dorick* Pillar is compoſed as well as the reſt of the *Shaft*, *Baſe*, and *Capital*, though *Vitruvius* makes no mention of the *Baſe*; and it's eaſy to conclude, that in the Ancient Buildings this *Order* had none; for we read, That when they would make the *Ionick Order* more beautiful than the *Dorick*, they added a *Baſe* to it; and there is yet to be ſeen in Ancient Buildings of this Order, Pillars without a *Baſe*; but when a *Baſe* is added to it, it muſt be the *Attick Baſe*, whoſe Proportion is as follows.

Baſe.

The whole *Baſe* ought to have a *Module* for its height; this *Module* being divided into three parts; one is for the *Plinthus*; the other two parts are divided into four, of which one is allowed for the upper *Torus*, the three which remain, are divided into two: The half below is for the lower *Torus*, the other is for the *Scotiæ*, comprizing the two little Squares or *Fillets*. The breadth of the *Baſis* in General is a 4th of the Diameter of the Pillar at the bottom added on every ſide; but this jetting is exceſſive, and without any Example, and *Vitruvius* himſelf makes it leſſer in the *Ionick Baſe*.

Capital. The height of the *Capital* as well as the *Baſe* is one *Module*, the breadth is two *Modules* and an half, the height of the Capital being divided into three parts; one muſt be allowed for the *Plinthus*, or *Abacus*, with its *Cymatium*; the other is for the *Echine*, with its *Anulets*; the third belongs to the *Gorge* of the *Capital*.

Architrave. The *Architrave* which comprehends its *Platte-Band*, with the *Pendant-Drops*, which are under the *Triglyphs*, is as well as the *Capital* of one only *Module*; the *Drops* with their little *Tringle*, ought to have the 6th part of a *Module*; the breadth under the *Architrave* ought to be equal to that above the Pillar.

Upon the *Architrave* in the *Frieſe* ought to be the *Triglyphs*, and the *Metops*. The *Triglyphs* have a *Module* and a half for their height, and a *Module* for their breadth; the *Metops* are as high as broad; one *Triglyph* muſt be placed directly upon every Pillar, and the *Intercolumnation* ought to have three; towards the Corners muſt be placed the *Demi-Metops*.

The breadth of the *Triglyph* being divided into ſix parts, five of them muſt be left in the middle, and the two halfs which remain on the right and the left, muſt be for *Demi-Graveurs*; The part in the middle, and the two laſt of the Five, muſt be for the three Feet, and the two which are betwixt the three Feet muſt be for the *Graveurs* or *Channels*, which muſt be hollowed, following the Corner of the *Maſon*'s Rule. The *Capital* of the *Triglyph* ought to have the 6th part of a *Module*.

Upon the *Capital* of the *Triglyph* is placed the great *Cornice*: Its Jetting or *Projecture* is half a *Module*, and the 6th part of a *Module*; its height is half a *Module*, compriſing the *Dorick Cymatium*, which is under it.

On the *Cielings* of the *Cornice*, muſt be hollowed little ſtrait ways, which muſt anſwer perpendicularly to the ſides of the *Triglyphs*, and the middle of the *Metops*.

Strait upon the *Triglyphs* muſt be cut 9 *Goutes* or *Drops*, which muſt be ſo diſtributed that there may be ſix length-wiſe, and three broad-wiſe ; in the Spaces which are betwixt the *Metops*, becauſe they are greater than thoſe between the *Triglyphs* : Nothing muſt be cut unleſs it be *Thunder-Bolts*. Moreover towards the border of the Crown muſt be Carved a *Scotia*.

Some advance perpendicularly above the *Triglyphs*, the Ends of the *Forces* or *Principals* to frame the *Mutils* which ſupport the *Cornices* ; ſo that as the Diſpoſition of *Beams* hath occaſion'd the Invention of *Triglyphs*, ſo the jetting of the *Forces* hath cauſed the Diſpoſition of the *Mutils*, which ſupport the *Cornices*. See Plate VI.

§. VII. Of the **Ionick** *Order*. *Pillar*.

§. VII. The Proportion of the Pillars of the *Ionick Order* had, in the beginning, Eight *Modules* or Diameters for their height ; but the Ancients quickly added half a Diameter, when to render this Pillar more beautiful than the *Dorick*, (not only for its height, but alſo for its Ornaments,), they added a *Baſe* to it, which was not uſed in the *Dorick Order*.

The Pillars may be ſet upon their *Baſes* two ways ; for ſometimes they were Set perpendicularly, and ſometimes not, *viz*. The outward rows of Pillars, when there were more ranks than one ; for that part of the Pillar which is towards the Wall of the Fabrick, muſt neceſſarily be perpendicular, and the outward part muſt have all the Diminution, and muſt lean towards the Wall.

The Pillars that are within the Porch, and are betwixt the Wall and the outward Pillar muſt ſtand perpendicularly.

Baſe.

The breadth of the *Ionick Baſe* is the Diameter of the Pillar, to which is added a 4th and an 8th part ; its height is half the Diameter ; This height being divided into three parts, one is allowed for the *Plinthus*, the reſt being divided into ſeven parts, three are allowed to the *Torus* above, after equally dividing the four which remain ; the two above are for the upper *Scotia*, with its *Aſtragal* : The two below are for the lower *Scotia*, which will appear greater than the upper, becauſe it extends to the edge of the *Plinthus*. The *Aſtragals* muſt have the 8th part of the *Scotia*, whoſe Jetting or Projecture muſt be the 8th part of the whole *Baſe* joyned to the 6th part of the Diameter of the Pillar, See Plate VII.

As to the *Capital*, the *Abacus* muſt have in its Square the Diameter of the bottom of the Pillar, adding to it an 18th part ; half of the *Abacus* ought to be the height of the *Capital*, comprizing the Round of the *Volute* or *Scroll* ; but there muſt be deducted from the corner of the *Abacus* inwards a 12th part and a half of the height of the *Capital*, and from thence perpendicular Lines muſt be drawn downwards ; and afterwards the whole thickneſs of the *Capital* muſt be divided into nine parts and an half, and one and an half muſt be left for the thickneſs of the *Abacus*, that the *Volutes* or *Scrolls* may be made of the eight which remain. Then having left under the *Abacus* four parts and an half of theſe eight, a Line muſt be drawn in the place which cuts the two a-croſs, and the Points of the Section ſhall be the *Center* of the *Eyes*, which ſhall have an eighth part for their Diameter ; in half the ſpace of the *Eye* ſhall be placed the Centers, through which ſhall be drawn with a Compaſs the Spiral-Line of the *Volute*, beginning the height under the *Abacus*, and going into the four Quarters of the Diviſion, diminiſhing till we come directly to the firſt Quarter, and giving to every Quarter a particular Center.]

Then the thickneſs of the whole *Capital* muſt be ſo divided, that of nine parts it contains, the *Volute* has the breadth of three under the *Aſtragal*, on the top of the Pillar, which muſt be directly upon the *Eye* of the *Volute* ; that which remains above the *Aſtragal*, muſt be allowed for the *Abacus*, *Channel*, and the *Echine* or *Egg*, whoſe jetting beyond the Square of the *Abacus* muſt be of the ſame bigneſs of the *Echine* or *Egg*.

The *Channel* or *Groove* muſt be hollowed the 12th part of its breadth.

The *Girdle* or *Cincture*, or the lateral part of the *Capital*, ought to advance out of the *Abacus*, as much as there is from the Center of the *Eye* to the height of the *Echine*.

The thickneſs of the *Axis* of the *Volutes*, which is the thickneſs of the *Volute*, ſeen ſideway, and which makes up the extreme parts of that which is called commonly *Baliſters*, ought not to exceed the magnitude of the *Eye*. See Plate VIII.

Theſe Proportions of the *Ionick Capital*, are only for Pillars of 15 Foot; thoſe that are greater require other, and generally the greater Proportions are required for the Pillars that are greater; and for this reaſon we have ſaid, that the higher the Pillars are, the leſs Diminution they muſt have. So when the Pillars are above 15 Foot, we muſt add a 9th part of the Diameter of the Pillar, to find the breadth to the *Abacus*; to which is never added more than an 18th part in Pillars of 15 Foot.

Architrave.

Their *Architraves* ſhall be laid upon the Pillars with Jettings equal to the *Pedeſtals*, in caſe they be not all of one ſize, but in form of Joint-Stools, to the end that Symmetry may be obſerv'd.

Their height ought to bear proportion to the height of the Pillar; for if the Pillar be from 12 to 15 Foot, we muſt allow the *Architrave* the height of half a Diameter of the bottom of the Pillar; if it be from 15 to 20, we muſt divide the height of the Pillar into 15 parts, to the end we may allow one to the *Architrave*; ſo if it be from 20 to 25, the height muſt be divided into 12 parts and an half, that the *Architrave* may have one; and ſo proportionably. The *Architrave* ought to have at the bottom which lies upon the *Capital*, the ſame breadth that the top of the Pillar hath under the *Capital*.

The Jetting of the *Cymatium* of the *Architrave* ought to anſwer to the bottom of the Pillar; the equally dividing the four which remain; the two above are ſor the upper *Scotia*, with its *Aſtragal*: The two below are for the lower *Scotia*, which will appear greater than the upper, becauſe it extends to the edge of the *Plinthus*. The *Aſtragals* muſt have the 8th part of the *Scotia*, whoſe Jetting or Projecture muſt be the 8th part of the whole *Baſe* joyned to the 6th part of the Diameter of the Pillar. See Plate VII.

As to the *Capital*, the *Abacus* muſt have in its Square the Diameter of the bottom of the Pillar, adding to it an 18th part; half of the *Abacus* ought to be the height of the *Capital*, comprizing the Round of the *Volute* or *Scroll*; but there muſt be deducted from the corner of the *Abacus* inwards a 12th part and a half of the height of the *Capital*, and from thence perpendicular Lines muſt be drawn downwards; and afterwards the whole thickneſs of the *Capital* muſt be divided into nine parts and an half, and one and an half muſt be left for the thickneſs of the *Abacus*, that the *Volutes* or *Scrolls* may be made of the eight which remain. Then having left under the *Abacus* four parts and an half of theſe eight, a Line muſt be drawn in the place which cuts the two a-croſs, and the Points of the Section ſhall be the *Center* of the *Eyes*, which ſhall have an eighth part for their Diameter; in half the ſpace of the *Eye* ſhall be placed the Centers, through which ſhall be drawn with a Compaſs the Spiral-Line of the *Volute*, beginning the height under the *Abacus*, and going into the four Quarters of the Diviſion, diminiſhing till we come directly to the firſt Quarter, and giving to every Quarter a particular Center.]

Then the thickneſs of the whole *Capital* muſt be ſo divided, that of nine parts it contains, the *Volute* has the breadth of three under the *Aſtragal*, on the top of the Pillar, which muſt be directly upon the *Eye* of the *Volute*; that which remains above the *Aſtragal*, muſt be allowed for the *Abacus*, *Channel*, and the *Echine* or *Egg*, whoſe jetting beyond the Square of the *Abacus* muſt be of the ſame bigneſs of the *Echine* or *Egg*.

The *Channel* or *Groove* muſt be hollowed the 12th part of its breadth.

The *Girdle* or *Cincture*, or the lateral part of the *Capital*, ought to advance out of the *Abacus*, as much as there is from the Center of the *Eye* to the height of the *Echine*.

The thickneſs of the *Axis* of the *Volutes*, which is the thickneſs of the *Volute*, ſeen ſideway, and which makes up the extreme parts of that which is called commonly *Baliſters*, ought not to exceed the magnitude of the *Eye*. See Plate VIII.

Theſe Proportions of the *Ionick Capital*, are only for Pillars of 15 Foot; thoſe that are greater require other, and generally the greater Proportions are required for the Pillars that are greater; and for this reaſon we have ſaid, that the higher the Pillars are, the leſs Diminution they muſt have. So when the Pillars are above 15 Foot, we muſt add a 9th part of the Diameter of the Pillar, to find the breadth to the *Abacus*; to which is never added more than an 18th part in Pillars of 15 Foot.

Architrave.

Their *Architraves* ſhall be laid upon the Pillars with Jettings equal to the *Pedeſtals*, in caſe they be not all of one ſize, but in form of Joint-Stools, to the end that Symmetry may be obſerv'd.

Their height ought to bear proportion to the height of the Pillar; for if the Pillar be from 12 to 15 Foot, we muſt allow the *Architrave* the height of half a Diameter of the bottom of the Pillar; if it be from 15 to 20, we muſt divide the height of the Pillar into 15 parts, to the end we may allow one to the *Architrave*; ſo if it be from 20 to 25, the height muſt be divided into 12 parts and an half, that the *Architrave* may have one; and ſo proportionably. The *Architrave* ought to have at the bottom which lies upon the *Capital*, the ſame breadth that the top of the Pillar hath under the *Capital*.

The Jetting of the *Cymatium* of the *Architrave* ought to anſwer to the bottom of the Pillar; the height of the *Cymatium* ought to be the 7th part of the whole *Architrave*.

The reſt being divided into 12 parts; three muſt be allowed to the firſt *Face*, four to the ſecond, and five to that above, upon which is the *Cymatium*.

Frieſe. The *Frieſe* ought not to be ſo high as the *Architrave* by a 4th part, unleſs ſomething be carved there; for then, that the Carving may look more graceful, the *Frieſe* ought to be bigger than the *Architrave* by a 4th part.

Cymatium. Upon the *Frieſe* muſt be made a *Cymatium*, whoſe height muſt be the 7th part of the *Frieſe*, with a Jetting equal to its height.

Dentil. The *Dentil* which is upon the *Cymatium*, ſhall have the height of the *Face* of the middle of the *Architrave*, with a Jetting or Projecture equal to its height; The cutting of the *Dentils* ought to be ſo made, that the breadth of every *Dentil* may have two parts of three, which maketh the breadth of the *Dentil*. The *Cymatium* which is upon the *Dentil*, muſt have the 3d part of the height of the *Dentil*.

Crown. The *Crown* with its little *Cymatium*, muſt have the ſame height with the *Face* of the middle of the *Architrave*:

The great *Cymatium* ought to have the height of an 8th part more than the *Crown* or *Drip*.

The *Projecture* of the whole *Cornice* comprehending the *Dentil* ought to be equal to the ſpace from the *Frieſe*, juſt to the top of the great *Cymatium*; and generally ſpeaking, all the Jettings ſhall have the better Grace when they are equal to the Jetting Members. See Plate VII.

§. VIII. *Of the* Corinthian Order. §. VII. The Pillars of the *Corinthian Order*, have no other Proportions than the *Ionick*, except in the *Capital*, whoſe height makes them appear ſlenderer and higher. The other Parts or Members, as the *Architrave, Frieſe*, and *Cornice*, borrow their Proportion from the *Dorick* and *Ionick*

Orders; for the *Corinthian Modillions* are imitated by the *Mutils* of the *Dorick Order*, and the *Dentils* are the ſame with the *Ionick*; ſo that we have nothing to do but to give the Proportions of the *Capital*, which are theſe; the *Capital* comprizing the *Abacus*, hath for its height, the breadth of the bottom of the Pillar.

To have the true breadth of the *Abacus*, we muſt make its *Diagonal* double the height of the *Capital*. The bending that the ſides of the *Abacus* have inward, is a 9th part of a ſide; the bottom of the *Capital* is equal to the Neck of the Pillar. The thickneſs of the *Abacus* is a 7th part of the whole *Capital*.

Foliage. Two of theſe ſeven parts muſt be taken for the height of every *Leaf*, of which there are two *Ranks*, each of which has four Leaves. The *Stalks* or little *Branches* are likewiſe compoſed of other *Leaves*, and thoſe which grow between the Leaves of the Rank above, ought to have two of theſe ſeven parts comprizing the *Volutes*, or *Scrolls*.

Volutes. Theſe *Volutes* begin with the Stalks, of which, thoſe that are the greateſt extend to the extreme parts of the *Angles* of the *Abacus*, the other are below the *Roſes*.

Roſes. The *Roſes* which are in the middle of every *Face* of the *Abacus*, ought to be as broad at the *Abacus* is thick.

The *Ornaments* of the *Corinthian Order*, viz. The *Architrave*, the *Frieſe*, and the *Cornice*, do not in the leaſt differ from thoſe of the *Ionick Order*. See Plate IX.

§. IX. Of *the Compoſite Order.*

§. IX. *Vitruvius* ſpeaks not of the *Compoſite Order*, as diſtinct from the *Corinthian*, the *Ionick*, and the *Dorick*: He only tells us, that ſometimes upon the *Corinthian Pillar* was placed a *Capital* compoſed of ſeveral parts, which were taken from the *Corinthian*, the *Ionick*, and *Dorick Orders*.

But a Conſequence may be drawn from thence that the *Order* at preſent called *Compoſite*, might have been in uſe in the time of *Vitruvius*, although then they did not make a diſtinct *Order* of it. Our *Compound Order* is not eſſentially different from the *Corinthian*, but by its *Capital*. But however this ſole difference of the *Capital*, ought to make it a diſtinct *Order* from the *Corinthian*; ſince according to *Vitruvius*, the *Corinthian Capital* alone, made the *Corinthian Order*.

The parts that our *Compound Order* borrow from the *Corinthian Order*, are the *Abacus*, and the two Ranks of the Leaves of *Brank Vrſin*, which it has retained, although the *Corinthian* have quitted them for the Leaves of *Olive*.

The other parts it takes from the *Ionick*, are the *Volutes*, which it forms in ſome manner according to the Model of the *Volutes* of the *Corinthian Order*, bending them even as the *Abaeus*; for they are direct upon the *Ionick Capital*, as well as the *Abacus*.

The *Echine*, or *Quarter-Round*, which it has under the *Abacus*, it borrows rather from the *Dorick Order*, than from the *Ionick*; becauſe this *Echine* is immediately under the *Abacus*, as it is in the *Dorick Order*, which is not in the *Ionick*, which between the *Echine* and the *Abacus*, places the *Channel* which makes the *Volute*; However it may be ſaid, that it imitates the *Echine* of the *Ionick Order*, in that it is cut with *Ovos* or *Eggs*, which are rarely found in the *Dorick Capital*, but are always in the *Ionick*.

AN ABRIDGMENT

Of the Ten BOOKS of

ARCHITECTURE,

Written by *VITRUVIUS.*

Part II.

Containing the Architecture *peculiar to the Ancients.*

CHAP. I.

Of Publick Buildings.

§. I. Of Fortreſſes.

§. I. B*Vildings* are either *Publick* or *Private*; And of the firſt ſome belong to *Security*, as *Fortifications*; others to *Religion*, as *Temples*; and others again to *Publick Convenience*, as Market-places, *Town-Houſes*, *Theatres*, *Academies*, &c.

The Diſpoſition of Ramparts was ſuch, as that the Towers advanc'd out of the Walls, that upon the Approach of the Enemy, the Beſieg'd might aſſault their Flank, both on the Right and the Left. They alſo took great care to make the Avenues to the Walls difficult, ordering the Roads ſo, that they came not directly, but to the Left of the Gate: By which means the right ſide of the Beſiegers, which was not cover'd by their Bucklers, was preſented open to the Beſieg'd.

Walls. The Figure of a *Strong* place, ought neither to be Square, nor compos'd of too *Saillant* or acute Angles; But the Ancients made their Ramparts with many Sinuoſities and Corners. The thickneſs of the Wall was ſuch, as that two armed Men might walk a-breaſt without juſtling.

Terraſſes. Tho' nothing makes Ramparts ſo ſtrong as Earth, yet they ſeldom made Terraſſes, unleſs where ſome Eminence was ſo near the Wall, that the Beſiegers might eaſily enter there. In this Caſe they ſtrengthened the two Walls that ſupported the Terraſs with *Buttereſſes*, or *Counterforts*.

Towers. Their Towers were round, becauſe they found by Experience, that the Corners of thoſe that were ſquare, were eaſily ruin'd by the Battering Engines.

Juſt over-againſt the Tower, the Wall was cut off within the Breadth of the Tower, and the Walls ſo cut off were only join'd with looſe Joiſts, that in caſe the Enemies made themſelves Maſters of ſome part of the Wall, the Beſieg'd might take up the Bridge of Joiſts, and hinder their advancing farther.

§. II. Of Temples. §. II. *Temples* among the Ancients were of two ſorts; ſome being round or ſquare after the *Greek*, and others only ſquare after the *Tuſcan* faſhion.

Square Temples. In the *Square Temple* of the Greeks there are three things to be conſidered, *viz.* The Parts that compoſe it, the Proportion of the *Temple*, and its *Aſpect*. The Parts of the Square Temple were generally five, *viz.* The *Porch* before the Temple call'd *Pronaos*; another *Porch* behind the *Temple* call'd the *Poſticum* or *Opisthedomes*; the middle of the Temple call'd *Cella*, or *Sacos*; the *Porticos* or *Iſles*, and the *Gates*.

The Porch was a cover'd place at the Entrance of moſt Temples, being as broad as the whole Temple, of which there were three ſorts: Some were ſurrounded with Pillars on three ſides; others had only Pillars in the Front, the ſides of the Porch being made up by the continuation of the ſide-Walls of the Temple; others were made up at the ſides, partly by Pillars, and partly by the Continuation of the ſide-Walls of the Temple. The *Poſticum* of the *Temple* was equal to the *Porch*, having alſo a *Gate*; but all Temples had no *Poſticums*, tho' almoſt every *Temple* had its *Pronaos* or *Porch*.

The middle of the Temple was a place inclos'd with four Walls, having no light but at the Gates, unleſs it were uncover'd.

The *Porticos* which made the Iſles were Ranks of Pillars, ſometimes ſingle, ſometimes double, which ſtood along the ſides of the Temple without, but ſome *Temples* wanted this part.

The *Gates* of *Temples* differ'd according to the Order of Architecture the Temple was built by: There was the *Dorick*, the *Ionick*, and the *Attick Gate*. The height of the *Dorick* Gate was found by dividing into three parts and an half, the ſpace from below to the bottom of the Cieling of the *Porticos*, which *Cieling* was call'd *Lacunar*. They allowed two of theſe Parts to the height of the Gate under the *Lintel*. This height was divided into 12 parts; five and an half were taken for the Breadth of the Gate below; for above it was ſtraiter by a third part. The breadth of the *Chambranle*, or *Door-Caſe*, was the 12th part of the height of the opening of the Gate. This *Chambranle* grew ſtraiter and ſtraiter towards the top; *viz.* The 4th part of its breadth; and it was only edg'd with a *Cymatium*, with an *Aſtragal*.

Upon the *Cymatium* above the *Door Caſe* was a *Frieſe* call'd *Hyperthyron*, which had the ſame breadth with the *Door-Caſe.* On this *Frieſe* was plac'd a *Dorick Cymatium*, with a *Lesbian Aſtragal*, both of them jetting out very little. On the *Mouldings* was plac'd the *Flat-Crown*, with its little *Cymatium*, which jetted out the whole Breadth above the *Door-Caſe* with its *Mould.*

The height of the *Ionick* Gates was taken as thoſe of the *Dorick*; but to find the right breadth, they divided the height into two parts and an half, of which they allow'd one and an half below, and ſtraitning it towards the top, as in the *Dorick* Gate. The breadth of the *Door-Caſe* was the 14th part of the height of the opening of the Gate. This breadth of the *Door-Caſe* being divided into 6, one was allow'd for the *Cymatium*, the reſt being divided into 12 parts, 3 were given to the firſt Face comprizing its *Aſtragal*, 4 to the ſecond, and 5 to the third. The *Frieſe* (call'd *Hyperthyron*) was made with the ſame Proportions as in the *Dorick Order.* The *Shouldering-Pieces* deſcended directly to the bottom of the Door-Caſe, without comprizing the Foliage, which they had at the bottom. The breadth above was the 3d part of that of the *Door-Caſe*, and at the bottom they grew ſtraiter by a 4th part.

The *Attick* Gates were like the *Dorick*, but their *Door-Caſes* had only a *Plat-Band* under the *Cymatium*, and this *Plat-Band* or *Face* had only the breadth of two parts in ſeven, into which was divided all the reſt of the *Door-Caſe* with its *Mouldings.*

Temples that were without *Pillars*, were twice as long as broad; but thoſe that had *Pillars* round about could not have this double Proportion; for as much of the length had only the double of the *Intercolumnations*, and conſequently a Pillar leſs than the double of the Pillars before and behind.

By the *Aſpect* of Temples, *Vitruvius* underſtands, firſt the Diſpoſition of the Parts in reſpect to one another; and the Diſpoſition of the *Temple* in reſpect of the Heavens.

As to the Diſpoſition of *Temples* in reſpect of the Heavens, the Ancients always obſerv'd to turn them towards the Sun-riſing, if the Place admitted of ſuch a Diſpoſition.

As to the Diſpoſition of the Parts, *viz.* of the *Porch*, *Poſticum*, *Iſles*, and *Gates*, it was different in the *Temples*, which were without *Pillars*, and in thoſe which had Pillars.

The Temples without Pillars were not 20 Foot broad. The length of theſe Temples being divided into 8 parts 4 were allow'd for the breadth, 5 for the length of the *Temple* within, and 3 for the *Porch*.

The Temples with *Pillars* were of 8 ſorts. The firſt and moſt ſimple was call'd *With Antes*, becauſe in this ſort of *Temples* there were only two Pillars in the Face or Front before, betwixt two *Antes*. There was three ſorts of theſe Temples.

The firſt had two Pillars before the Face of the Temple, at whoſe Corners there were two *Antes*, and the two Pillars ſupported a *Pediement* or *Fronton*. The ſecond ſort had alſo but two Pillars, but they were between two *Antes* on the ſame Line with the *Antes*, and theſe *Antes* with the two Pillars made up the Face of the *Porch* of the *Temple*. The third ſort was, when between two Pillars, which were at the Face before, and which made up the Porch; there were likewiſe two others within the Porch. Theſe Temples had alſo this Particular to themſelves, that the Front of the Porch was cloſed with Partitions of *Marble*, or *Joyner's* Work, which ran from the *Ante* of one of the Corners to its Neighbouring Pillar, and from this *Ante* to the other *Pillar*, and then from this Pillar to the other *Ante*.

The ſecond ſort of Temples with Pillars, call'd *Proſtyle*, differ'd from the firſt only in this, that beſides the two Pillars of the Temple *With Antes*, there were two others directly on the *angular Antes.*

The third ſort was call'd *Amphiproſtyle*, becauſe it had Pillars both before and behind.

The fourth ſort was the *Periptere*, which had ſix Pillars in the Front, ſix behind, and twelve on each ſide, comprizing thoſe of the Corners. The diſtance between the Pillars and the Walls was equal to the diſtance between two Pillars.

The fifth call'd the *Pſeudo-diptere*, that is, falſe *Diptere*, had 8 Pillars on the Front, as many behind, and 15 on each ſide, including thoſe of the Corners. The P*illars* were diſtant from the Wall the ſpace of two *Intercolumnations*, and the thickneſs of a Pillar.

The ſixth ſort was the *Diptere*, which had 8 Pillars before and behind, and two Rows round about.

The ſeventh call'd *Hypethre* (becauſe the inner part of the Temple was uncover'd) had 10 Pillars before and behind ; and as to the reſt was like the *Diptere* but in this, which was particular to it ſelf, that all about it had two Orders of Pillars, at a little diſtance from the Wall, to make *Porticos*, as in the P*eriſtyles*.

The eighth call'd *Pſeudo-Periptere* (or falſe *Periptere*, becauſe the Diſpoſition of its Pillars was equal to that of the *Periptere*) had ſix Pillars before and behind, and eleven in the *Iſles* or *Wings*. But the Diſpoſition of the Walls of the Temple was different in this, that they extended even to the Pillars, which therefore made no *Portico*, except thoſe of the Porch, which were inſulated, or ſtood alone like Iſlands.

Round-Temples.

The *Round-Temples* were of two ſorts : The firſt were call'd *Monopteres*, becauſe they had no Walls, but only an *Iſle* or *Wing*, viz. *Pillars* which ſupported a *Cupola*. Their Proportion was, that dividing the whole Temple into three, one part was allow'd for the *Steps* upon which the *Pillars* were placed, which had their height equal to the diſtance from one Pillar, to that which was Diametrically oppoſite to it. The ſecond ſort call'd *Periptere*, had Pillars upon their Baſes round about the Temple; the ſpace between the Baſis and the Wall was the 5th part of the whole Temple: And the Diameter of the *Temple* within was equal to the height of the Pillar.

The Temples after the *Tuſcan* faſhion were ſquare, having 5 parts in *Length*, and 4 in *Breadth*. The Porch which was as great as the reſt of the Temple had four Pillars in the Front; the ſides were cloſed half by the continuation of the Walls of the Temple, and half by two *angular Pillars*; and there were likewiſe two Pilars in the middle of the Porch. This Temple had two Chappels within, one on each ſide.]

§.III. Of Publick Places *for the Conveni-ence and Uſe of all People.*

§. III. The *Fabricks* for the Convenience and Uſe of all People are of ſix ſorts; *viz. Market-Places*, *Baſilicas*, *Theatres*, *Gates*, *Baths*, and *Academies.*

Market-Place.

The *Market-Places* among the *Greeks* were ſurrounded with Pillars cloſe one by another. Among the *Romans*, the Pillars which environed the *Market-Plates*, had larger *Intercolumnations*; for they made *Periſtyles* for Shops.

Baſilica.

The Proportion of the *Market-Places* was ſo ordered, that having divided the length into three parts, they allowed two for the breadth; the *Baſilicas* had never leſs breadth than the third part of their length, nor more than the half.

The Pillars were as high as the Iſles or Wings were broad, and theſe Iſles had a third part of the great Vault in the middle. There was likewiſe a ſecond Rank of Pillars upon the Wings, which made high Galleries, and theſe ſecond Ranks of Pillars were placed upon a *Pedeſtal* in the form of a Partition, high enough to hinder thoſe that were in the high Galleries from being ſeen by thoſe that were below.

At the end of every *Baſiliea*, there was a high and great Hall called, *Chalcidiques*, which were join'd one to another by high Galleries, and which ſerv'd for the Spectators while the Magiſtrates adminiſtred Juſtice.

Theaters. The *Theatres* had three parts, *viz*. The *Steps*, which were inſtead of Seats for the Spectators. They were in form of a Semi-circle, and encloſ'd a void ſpace in the middle, and at the bottom of the whole *Theater*, which ſpace was call'd *Orcheſtra*. The *Orcheſtra* was to Dance *Entries* in the *Grecian Theatre*; but in the *Roman*, where Entries were perform'd on the Stage, the *Orcheſtra* was for the Senators to ſit in.

Above and quite round the Steps was a *Portico* of Pillars, the Steps being ſeparated by divers Landing-Places, which went round and by ſtrait Paſſages, aſcending from one Landing-Place to another; ſo that the way which led from the ſecond Landing-Place to the third, parted betwixt thoſe of the firſt, and ended betwixt thoſe of the third. The Steps were 14 or 15 Inches high, and from 28 to 30 Inches broad.

Under the Steps, above every Landing-Place, there were in the great *Theaters* 13 *Chambers*, in which were Veſſels of Braſs ſet to ſeveral Tunes, which by their Eccho ſtrengthened the Voice of the Players. The *Scene* or *Stage* was compoſ'd of the *Pulpit*, the *Proſcenium*, and the *Paraſcenium*. The *Pulpit* was the place on which the Players Acted, and which was never rais'd above five Foot from the *Orcheſtra* or *Pit*.

The *Proſcenium* or Front of the *Stage*, was adorn'd with Pillars of ſeveral ſorts, one above another. Theſe Orders were ſo proportion'd, that the ſecond was a fourth part leſs than the firſt, and the third diminiſhed according to the ſame Propottion. The Front had three Gates; the middlemoſt and greateſt was call'd the *Royal Gate*; the two others were call'd the Gates of Strangers: Theſe three Gates were cloſ'd with

Machines, made in a Triangle, and compos'd of three Fronts, or *flat Scenes* well painted, to repreſent Buildings in Perſpective. Theſe Machines ſerv'd for the ſhifting of the Scenes; and the Paintings repreſented three ſorts of Buildings, which made three ſorts of Scenes, *viz.* The *Tragick* by *Stately Palaces*; the *Comick* by private Houſes, and the *Satyrical* (or *Paſtoral*) by *Fields* and *Groves.*

The *Paraſcenium* or *Poſtcenium* was the hinder part of the Stage, where the Actors dreſſed themſelves, had their Rehearſals, and kept the Machines. Near the *Theaters* were publick Walks, a *Stadium* in length, planted with Trees, and ſurrounded by double *Porticos*, as broad as the Pillars on the outſide were high; for the Pillars within were higher by a 5th part, and theſe were alſo of a different Order; to wit, of the *Ionick* or *Corinthian*, whereas the Pillars without were of the *Dorick* Order.

Ports. The *Ports* or *Havens* of the Ancients were either *Natural* or *Artificial*. At firſt, they only made *Portieos* round about with *Magazines* and Towers at the Ends, to ſhut the Port with a Chain. *Artificial* Ports were built three ſeveral ways: The firſt was to make Partitions of Wood only, (without draining the Water that was within the Partitions) and to throw into the Partitions Stone and Mortar made with *Pozzolana*, which would grow dry and ſolid in the bottom of the Water. The ſecond way was by making Partitions with ordinary Clay, or fat Earth at the bottom of the Sea, after the Water had been pump'd out; The third way was to build a Mole on the Sea-Coaſt, and to throw it in when the Maſon's Work was ſufficiently dry, which required but two Months time. The better to throw theſe Moles into they Sea, they built them half upon the Sea-Coaſt, and half upon an heap of Sand which they gather'd cloſe to the Sea-ſide, to the end that this Sand which was ſtopt only by the Walls, built in order to ſupport it, during the time the Mole was a drying, might let it go off when the Sea came in and carried away the Sand, after the Walls were beaten down.

Baths. The *Baths* of the Ancients had many Apartments: Some for Men, and others for Women; Some of the Chambets had a moderate Heat, only to prepare People for a ſtronger Heat, to make them ſweat. The Sweating-Room, call'd *Laconicum*, was round and vaulted like an Oven, and receiv'd the light by a round opening at the top, which open'd and ſhut with a Buckler of Braſs, that hung at a Chain, by which means they encreas'd or diminiſh'd the Heat, according as they let down or pull'd up the Buckler.

One and the ſame Furnace heated both the Air and the Water, according to the Diſpoſition of the places which were nearer or further from the Furnace; whoſe Heat was communicated to the Chambers from under the Flooring, which was made full of little holes.

The Water was likewiſe variouſly tempered by the different ſituation of three great Veſſels of Braſs, whoſe Water went from one into another, and there were Pipes that conveyed theſe three ſorts of Water into the *Bath*.

Acamedies. The *Academies* of the Ancients, which they called *Palæſtra*, were places where the Youth was taught Humane Learning, and their Exerciſes. They were compoſed of three parts, *viz*. Of a *Periſtyle*, a *Xyſte*, and a *Stadium*; the *Periſtyle* was a Court ſurrounded with *Porticos*, which were of two ſorts; three of them were Simple, and one Double. The Simple ſtood in a row againſt three Bodies of Lodgings, compos'd of many great Halls, where the Philoſophers had their Diſputes, and held their Conferences. The Bodies of the Lodgings, which were the length of the double *Portico*, and one part of the Lodgings which turn'd in, were divided into ſeveral parts for the Studies and Exerciſes of Youth; for there they had their *Claſſes* or *Forms*, their **Baths**, **Stoves** and *Tennis-Courts.*

The *Xyſte* was a place planted with Trees, and ſurrounded with *Porticos*; which latter were of two ſorts: The one was double, and ſet againſt the Bodies of the Lodgings, to which the Double *Portico* of the *Periſtyle* was joyned. The Simple *Porticos* had two Wings; and under theſe Simple *Porticos* there were hollow Ways, where they perform'd their Exerciſes; the reſt of the *Portico* was rais'd to the right and the left, for ſuch as had a mind to walk, while the others were about their Exerciſes. The Place encompaſs'd by theſe three *Porticos* was planted with Trees, Set into Alleys, where the Wreſtlers exercis'd in Winter, when the Weather was fair.

The *Stadium* was on the ſide of the *Periſtyle*. It was an Alley 90 Perches long; on each ſide it had many Steps, which made a Sort of a long *Theater* bending in at both Ends: On theſe Steps Sat the Spectators to ſee thoſe that ran in the *Stadium.*

CHAP. XI.

Of *Private* Buildings.

§. I. Of the *Courts* of *Houſes.*

§. I. THE Houſes of the Ancients had five Sorts of *Courts*, which for the moſt part were cover'd round about by the jettings which ſupported the Gutter, in which all the Water that fell from the Roof met together.

Theſe Courts made with Jettings were of four Sorts: The firſt, call'd the *Tuſcan*, was ſurrounded with a Penthouſe laid on four Beams ſupported by other upright Beams plac'd in the Corners. The ſecond call'd *Corinthian*, had Beams likewiſe; but they were further from the Walls than in the *Tuſcan* Court, and were beſides laid on Pillars. The third, call'd *Tetraſtyle*, becauſe the Beams were ſupported by Pillars, inſtead of the upright Beams, that were made uſe of in the *Tuſcan* Court. The fourth was call'd the *Vaulted*, becauſe the Penthouſe was in form of a Vault and ſupported by Arches.

The fifth Sort of Courts which had no Penthouſe, and was call'd the uncover'd, had the *Water-Gutter* directly upon the Wall, and had no other Covering beſides the Entablature.

§. II. Of the Entry.

§. II. The Houſes of the Ancients had great and magnificent *Veſtibules* or *Entries*, which were ſometimes 270 Feet long, and 160 broad, and ſupported by two Ranks of Pillars which form'd a Wing on each ſide. The Proportion of their breadth and length was taken three ways. The firſt was when having divided the length into 5 Parts, 3 were allowed for the Breadth; The ſecond, when two thirds of the length were given to the Breath; And the third, when having made an equilateral Square, the Diagonal was taken for the length, and the ſide for the Breadth. The Height was equal to the length from the Pavement below to the bottom of the Cieling, which was hollow'd on the other ſide the Beams, the ſeventh Part of the whole Height. As for the Proportion which the *Alley* in the middle between the Pillars had with the Wings, it differ'd according to the Magnitude of the *Entry*.

§ III. Of Halls.

§. III. The Ancients had three Sorts of Halls, *viz.* The *Corinthian*, *Ægyptian*, and *Cyzican*. The firſt had Pillars round about againſt the Wall, and theſe Pillars ſupported the Cieling, which was Vaulted. The *Ægyptian Halls* had their Pillars diſtant from the Wall in the manner of the *Periſtyle*, and theſe Pillars ſupported only an *Architrave* without the *Frieſe* or *Cornice*; upon this *Architrave* there was another Row of Pillars, between which were the Windows: The Floor which reach'd from the Pillars to the Walls, ſerv'd for a Terraſs without. The *Cyzican* Halls were chiefly made uſe of by the *Greeks*, and had this in Particular, that they were turn'd to the North and had a Proſpect of the Gardens. Their Length was double their Breadth; and as to their Height, (this Rule was obſerv'd to have the Height of all Sorts of Apartments that are not ſo broad as long) they added their Breadth to their Length, and took half of the whole for their Height. The Apartments which were no longer than broad, had their Breadth and an half in Height.

§. IV. The *Greeks* and the *Romans* differ'd in the Diſtribution and Ordering of their Apartments. The *Romans* had magnificent Courts and *Entries*, but the *Greeks* had only a narrow Entry, thro' which they paſs'd into a *Periſtyle*. This Entry had on one ſide a Porter's Lodge, and on the other ſide were the Stables.

Of the Diſtribution *of the Apartments.*

Among the *Greeks* the Apartments of the *Women* were ſeparate from the Apartments of the Men, inſomuch that theſe dined by themſelves. The *Greeks* had alſo particular Rooms reſerv'd for Strangers where they only gave them Lodgings, and never treated them above one Day.

CHAP. III.

Of Things equally belonging to Publick and Private Buildings.

§ I. TO know whether the *Waters* can be brought to a Town, or no, the Level of the Country round about muſt be exactly taken.

§. I. *Of* Aqueducts.

In order to this, the Antients made uſe of an Inſtrument call'd *Corobates*, which was directed by a Lead, and by Water, when the Wind hindred them from making uſe of the Lead.

They convey'd their Water three ſeveral Ways, *viz.* by *Aqueducts*, by *Pipes of Lead*, and by *Pipes of Clay*, baked in a Potter's Furnace. They allow'd for the Channels, or Sewers of the Aqueducts, half a Foot of Declination or ſloping, for every 100 Foot and if any Hills happen'd to be in their way, they dug thro' them, making Vents to give Air at convenient Diſtances.

The Leaden Pipes were at leaſt 9 Foot long and of different thickneſs, according to their Greatneſs. Theſe Pipes had alſo their neceſſary ſloping, and if any Valley was in the Way, they made it equal to the Level with a Wall. They likewiſe made many Vents, to give the Water Air, and to know where to mend the Pipes.

The Pipes of *Potter's Work*, were two Inches thick. They were join'd together with Mortar mixed with Oil, and when they had a *Joint* to make, they bored thro' a red free Stone, to receive the two Ends of the Pipes.

§. II. Of Wells *and* Ciſterns.

§ II. The Ancients having taken notice that the Water, which is under Ground, has ſometimes many bad Qualities, and exhales Vapours which often ſtifle thoſe that Work in the *Wells*; they us'd therefore this Precaution: As ſoon as the *Well* was dug, and the Water began to gather together, they let a Lamp gently down into it, and if the Lamp went out, they took it for an infallible Sign that the Water was unwholſom.

The *Ciſterns* were contriv'd to receive *Rain-Water* in great *Conſervatories* under ground, whoſe Walls, on all ſides, and at the bottom, were built with ſtrong Lime and Sand, and Pebbles, all well beaten together. They put Salt in their *Ciſtern-Water* to render it more ſubtle.

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§ III. *Cteſiphon* and his Son *Metagenes*, who built the Temple of *Epheſus*, invented *Machines* to carry great Stones for *Pillars* and *Architraves*. That which was made to draw the *Pillars*, was but a ſort of a *Frame*, as long as the *Pillars*, in the end of which were faſtned Pins of Iron, which entred into the Ends of the *Frame*, and ſerved inſtead of an Axle-Tree, the *Pillar* it ſelf ſerving, as it were, for a Wheel. This *Machine* was uſeful, becauſe of the Diſpoſition of the Place, thro' which the Stones were to be drawn, which was a flat and level Country.

§. *III.* *Of* Machines *for lifting up great Burdens.*

The other *Machine* for drawing *Architraves*, was the ſame Frame which had two Wheels at each end, which ſupported the *Architrave*; which ſerved inſtead of an Axle-tree.

For the Raiſing of great Weights, they had three ſorts of *Machines*. The firſt was compos'd of three pieces of Wood, which were joined together at top by a Pin, which went through them all; ſo that there were two of theſe pieces which were on one ſide, a little diſtant one from the other, and the third was oppoſite to them. The two, which were together on the one ſide, had a Hand-Mill which drew a Rope, which paſſed within a Truckle with three Pullies, of which that part which had the two Pullies, was faſtned to the top of the *Machine*, and that which had but one, was faſtned to the Weight that was to be drawn up.

The ſecond *Machine* was ſtronger than the firſt, becauſe the Truckle had more Pullies, and inſtead of a Hand-Mill, it had a great Wheel, whoſe Axle-tree drew a Rope which paſſed through theſe Pullies, and upon the Wheel there was another Rope twiſted, which was drawn by a Wind-Laſs; ſometimes the great Wheel was hollow, ſo that Men could walk within it, and ſo turn it.

The third had but one long and ſtrong piece of Wood, which was kept up and ſtayed by Shrowds, as the Maſt of a Ship is. By the help of theſe Shrowds, they bended and turned this piece of Wood where they pleaſed, drawing the Shrowds faſt on the one ſide, and looſening them on the other. The Truckles, as well thoſe which were faſtned to this piece of Wood, as thoſe which were faſtned to the Weight which was to be drawn up, had each of them 3 ranks of Pullies, which had three in every rank, that three Ropes might go through them, which were not drawn by Hand-Mills, nor by Wheels, but by Men who pulled ſeveral at one time at the ſame Rope; And that this might be done with the more eaſe, the three Ropes or Cables after having paſſed the laſt Pullies, of that part of the Truckle which was at the top of the *Machine*; they deſcended down below, each upon one Pully, which was but the height of the Men: This *Machine* quickly powerfully lifted up the greateſt Weights.

§. IV. *Of Machines for Raiſing Waters.*

§ IV. THESE *Machines* were of four ſorts. The firſt was the *Tympan*, of which there were two ſorts; The firſt rais'd a great deal of Water, but not very high, for it only mounted to the Axle-Tree of the *Tympan*, which was a great Wheel made of Planks, which made two bottoms, divided into eight, from the Center to the Circumference; Each Separation, having an opening half a Foot wide near the Circumference to draw the Water, which being elevated upon the Axle tree, ran through the Cavities which were hollowed in each Separation.

The Second *Machine*, was a Wheel which elevated the Water as high as its Circumference, by the help of ſeveral Boxes which were faſtned round about, and which poured out the Water into a Reeve, as the Wheel, after having mounted, began to deſcend.

The Third *Machine* was a Chain with Buckets, of which as the one mounted, the other deſcended. being drawn by an Axle-tree.

The Fourth *Machine* was the Vice or *Skrew*, which is attributed to *Archimedes*, though *Vitruvius* makes no mention of the Inventor. This Vice was made of a piece of Wood, long ſixteen times its Diameter. About this piece of Wood was put obliquely a Hoop of Willow beſmeared with Pitch, and it was Conducted by turning it from one end of the piece of Wood to the other: Upon this Hoop other Hoops were put ſo that they were like a winding Stair-Caſe. This being done, this Vice was faſtned and ſtrengthned with Planks, which were pitched within, covered with Iron-Rings and Plates without: At the two ends of the piece of Wood, were Pins, which entring into the Suckets, made the *Machine* capable of Motion. This Vice or Skrew was placed according to the Bent or ſloping of the Triangle Rectangle of *Pythagoras*. This *Machine* drew eaſily a great Quantity of Water, but it could not carry it high.

The Fifth *Machine*, was the Pump of *Cteſibius*, compos'd of two Bodies of Pumps, in which the Suckets having drawn the Water when they were pulled up, they both preſſed it violently into a Pipe which was faſtned at the bottom of the Body of the Pump when they went down. For the Water by the Impulſion of the Sucket, was forced to enter into theſe Pipes, becauſe it could not go out thro' the Openings at which it entred, becauſe of the Suckets which ſtopped them; Theſe two Pipes were joyn'd together in a *Tympan*, which had likewiſe its Suckets, which hindred the Water from deſcending into the Bodies of the Pumps, after it had been preſſed into the *Tympan*, or *Vaſe*, which had another Pipe, through which the Water was forced as high as they pleaſed, by the Impulſion of the Suckets.

All theſe *Machines* were either mov'd by Strength of Hands, or by Water-Mills, according to the Convenience of the place.

§. V. Of Waters-Mills *to Grind Corn.*

§. V. *Water-Mills* for Grinding Corn were moved by the help of a great Wheel which had many Wings, which were forced by the Current. The Axle-tree of this great Wheel, traverſed a Cog-wheel, which turn'd the *Lanterne* or *Trundle-head*, which was placed Horizontally, and was traverſed by a Beam of Iron, which entred above, into an Iron in form of an Ax, which helped to faſten the Beam in the Mill-ſtone, above which was the Mill-Hopper, in form of a Funnel.

§. VI. *Of other Hydraulick Machines.*

§. VI. There were many other *Machines* which moved by the help of the Water, as *Hour-Glaſſes*, *Organs*, *Machines* for Meaſuring the Way's and knowing the ſwiftneſs or ſlowneſs of Sailing.

The *Hour-Glaſſes* marked the Hours by the help of the Water, which paſſing ſlowly thro' a little hole made at the bottom of a Veſſel, and falling into another, as it elevated it ſelf inſenſibly in the Veſſel which it filled, raiſed a piece of Cork, which hung at one of the ends of a Chain wraped about an Axle-tree, and which had at the other end a little Bag full of Sand, and a little lighter than the Cork: for this Chain turning the Axle-tree, it likewiſe turned a Pin or Hand, which marked the Hours upon a Dial.

The *Organs* play'd by the help of two Suckets, which were pulled up or let down in the Bodies of the Pump. The Suckets puſhed the Air with violence into a Funnel reverſed in a Copper Box half full of Water, and preſſed the Water, and conſtrained it to aſcend round about within the Box, which made its weight, by making it re-enter into the Funnel, puſh the Air into the Pipes, and ſo made them Play, producing the ſame Effects that the Bellows do now a days.

They meaſured the way that the Ships make by the help of a little Mill, which was faſtned to the Ship, and which turned by the reſiſtance its Wings found in the Water, when the Ship Sail'd forward. The Axle-tree of this Mill had a little Tooth, which at every round puſhed forwards one of the Teeth of the great Wheel, which turned another, and that another which turned a Pin or Handle, which marked the number of Turnings, that the Mill made; by which means it was eaſie to take an account of the Leagues the Ship had Sail'd, They made uſe of the ſame *Machine* on Land, fixing to the Nave of the Wheel of a Coach, a Tooth which turned many Wheels as in the above-mentioned *Machine*, at the laſt of which, was faſtned a Pin or Handle, which mark'd the number of Perches and Leagues. This *Machine* had likewiſe a ſort of a Counting Wheel, which at every Mile that the Coach went, let a Pebble fall into a Veſſel of Braſs, to give notice that they had gone a Mile.

§. VII. Of Warlike Machines.

§. VII. The Warlike *Machines* of the Ancients were of three Sorts, for they were made to fling either Arrows, ſuch as were the *Scorpions*; or *Javelins*, ſuch as were the *Catapulta's*, or Stones, ſuch as were *Balliſtas*; or fiery Darts, ſuch as were the *Pyroboli*; or they were made to beat down the Walls, ſuch as were the battering Rams, and the *Terebra*, or to approach the Walls covered, and ſafely mount the Ramparts, ſuch as were the *Tortoiſes* or *Teſtudos*, and the Towers of Wood.

Scorpions.

The *Scorpions* were a ſort of great Croſsbows, which were made uſe of to defend the Walls, and which likewiſe the Aſſailants made uſe of in the Wooden Towers, to annoy the Beſieged.

Catapulta.

The *Catapulta* threw Javelins from 12 to 15 Foot in length; it was made of two Trees, ſet one againſt another, like the Maſts of a Ship, which were bended by drawing them with a Hand-Mill. Theſe Trees being on a ſudden unbent, furiouſly ſtruck together, and forced violently the Javelin. They were bent the one after the other by the ſame Cord, which was made of Guts, to the end, that the Maſter who managed the Engine, might be aſſured, that the two Trees or Beams were equally bent. This he knew by ſounding the Cord when both the Beams were bent, and when the End above was drawn even to the Capital of the *Machine*, where they were ſtayed by a Pin of Iron which was driven out by a quick ſtroke of a Hammer, when they unbent it. There was a Cylinder which traverſed an excentrical piece, by the help of which they lifted up, or let down, the End of one of the Beams below, according as the Maſter of the *Machine* judged it neceſſary, for the augmenting or diminiſhing their Bent, which was known by the Sound of the Cord, which Sound was alike in both, when they were epually bent. See Plate XI.

Balliſtas The *Balliſta's* were bended and ſtrung as the *Catapulta's*, but inſtead of Javelins, they caſt great Stones.

Pyroboli The *Pyroboli* were *Machines*, which caſt Darts, to which was fixed combuſtible Matter, which was kindled when they darted them againſt *Machines* of War, or Shipping.

Battering Ram. The *Ram* was to beat down Walls and make Breaches. It was a great Beam headed with Iron, and it was hung by the middle, and puſhed by ſtrength of Hands, with great violence, againſt the Walls.

Terebra. The *Terebra* was ſomething like the *Ram*, being a ſtrong Beam pointed with Iron, but it was ſharp pointed, and it made way for the *Ram*, ſplitting the Stones.

Teſtudo. The *Teſtudo* or *Tortoiſe*, were great, large and low Towers of Wood, which were rowled upon ſix or eight Wheels, and covered with raw Hides to defend them from fire. Their uſe was

o

to cover those that approached the Walls in storming them, or beat them with the battering Rams.

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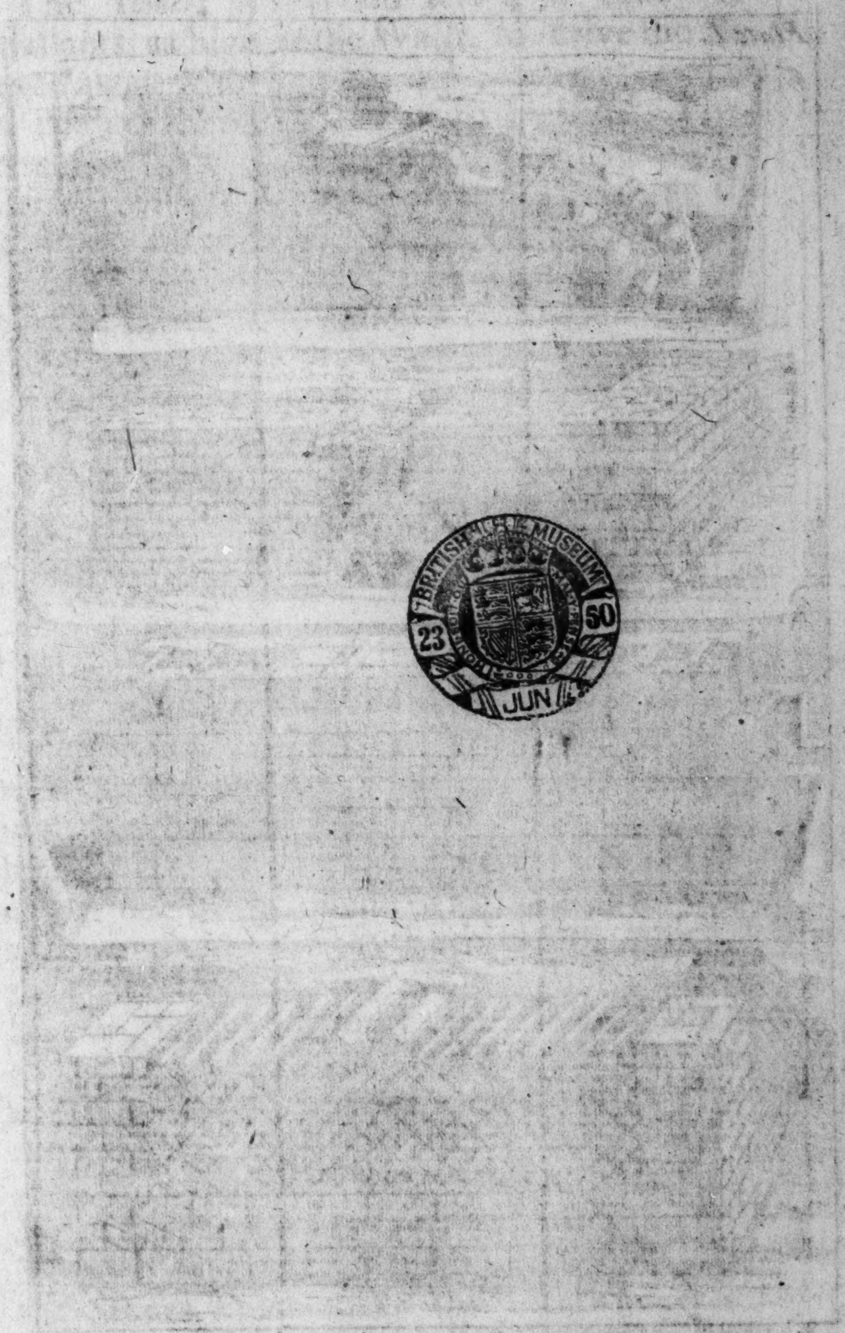

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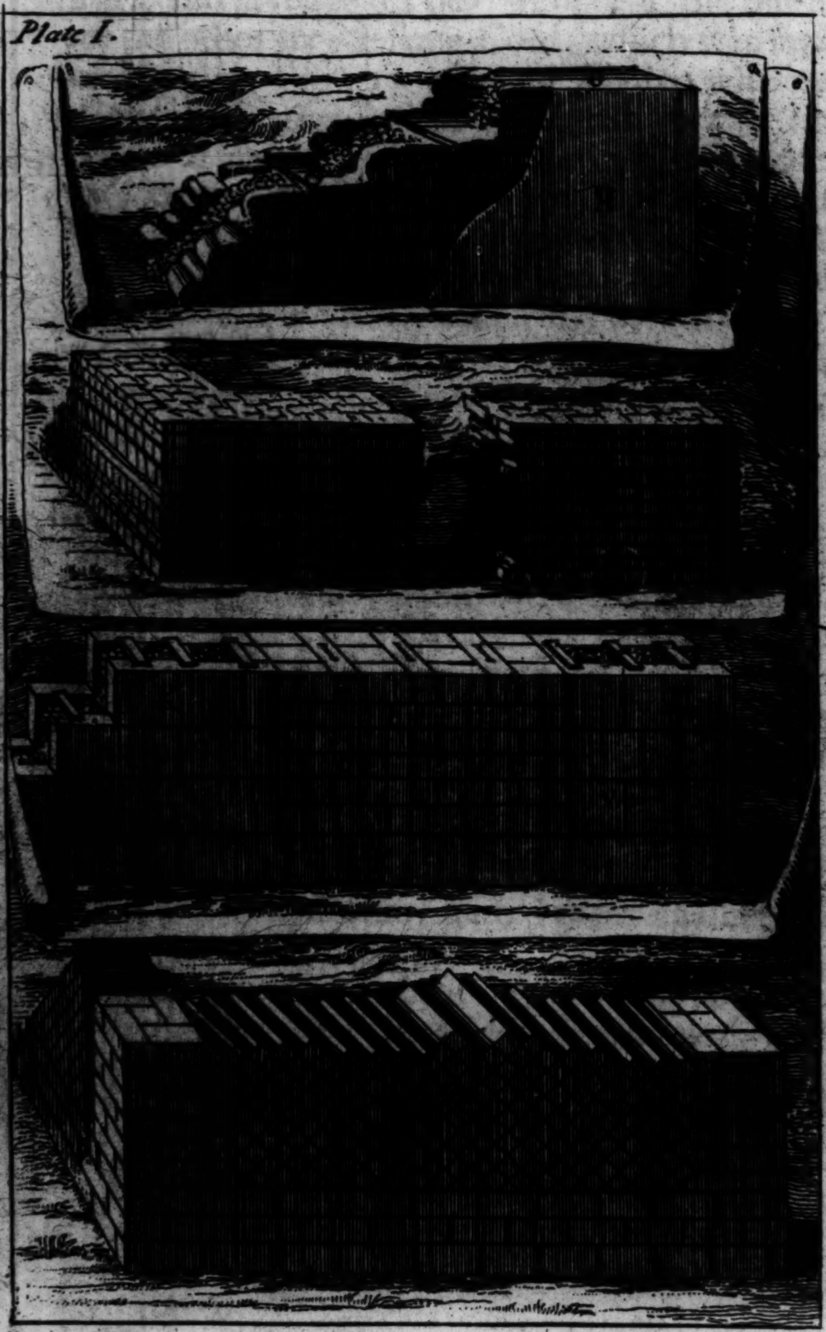
[illegible] up with Rubbish, and [illegible] Courses [illegible] together with Cramp-irons.

THE

Plate I.



to cover thoſe that approached the Walls to undermine them, or beat them with the battering *Ram.*

The *Towers of* Wood ſerv'd to raiſe the Aſſailants as high as the Walls, to drive the Beſieged away with Arrows and Scorpions, and to lay Bridges from the Towers to the Wall. They were ſometimes Thirty Fathoms high, having Twenty Stages. They were covered, as the *Tortoiſes* with raw Hides; And had each of them a Hundred Men, which were employed as well to move them, as to annoy the Beſieged.

The End of *VITRUVIUS.*

The Explanation of the Firſt PLATE.

THE Firſt PLATE contains the ſeven ſeveral ſorts of Maſonry; A is the firſt, which was called *Reticulatum*, becauſe it was like the Maſhes of Nets; BB is the ſecond, it's called *Inſertum*, that is to ſay, *Bound Maſonary*, becauſe the Stones are bound one within another, every one being bound with four, two below, and two above: CC is the third ſort, which was particular to the *Greeks*; it may be called *double-binding*, for it's not only of Stones of the ſame courſe, but of two courſes, III, D, is the fourth, called *Iſodomum*, becauſe the Beds or Lays are equal in height. E is the fifth, called *Pſeudiſodomum*, becauſe they are of an unequal heighth. FF, GG, H is the ſixth, called *Emplecton*, becauſe it was filled up any way in the middle. FF are the Stones which make the Courſes. K is the ſeventh, which may be called *Compound*, becauſe its Courſes are of hewn Stone, and the middle filled up with Rubbiſh; and theſe Courſes are faſten'd together with Cramp-irons.

The Explanation of the Second PLATE.

THE Second PLATE contains the five ſorts of Edifices: AA is the *Pycnoſtyle*; that is to ſay, where the Pillars are very cloſe, the *Intercolumnation* being but one Diameter and a half of the Column: BB is the *Syſtyle*, *viz.* where the Pillars have two Diameters of *Intercolumnation*: CC is the *Diaſtyle*, *viz.* where the Pillars are at that diſtance, that they have for the Intercolumnation three Diameters: DD is the *Areoſtyle*, where the Pillars are far aſunder. There is no certain Proportion; we have given in this Figure four Diameters of Intercolumniation, it may have more: The fifth ſort called *Euſtyle*, is in the third PLATE.

The Explanation of the Third PLATE.

THE Third PLATE contains the Plan and Elevation of the fifth ſort of Edifices, called *Euſtyle*, *viz.* where the Pillars are diſtant one from another by a more convenient Proportion. Its *Intercolumnations* have all two Diameters and a quarter, except the *Intercolumnations* in the middle of the *Face* beſore and behind, which have three Diameters.

This Plan ſhews the different Parts of the ancient Temples: AA, AA, are the Iſles or VVings which are *Portico*'s, having a Range of Pillars on the one ſide, and the VVall of the Temple on the other. B is the part called the *Pronaos* or Porch. C is the part called *Poſticum*, *viz.* the hinder part of the Temple. D is that Part called *Cella*, or the Nave or the Body of the Temple.

THE

Plate.II.

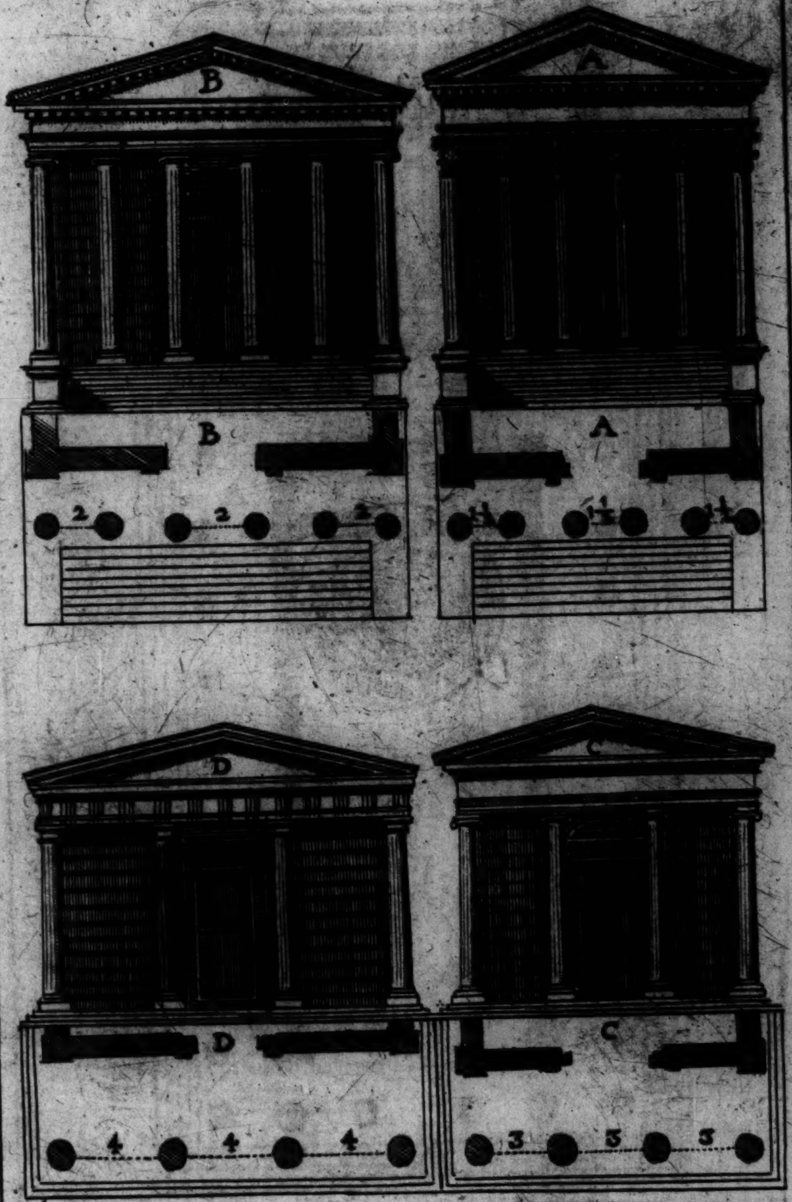


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Plate III

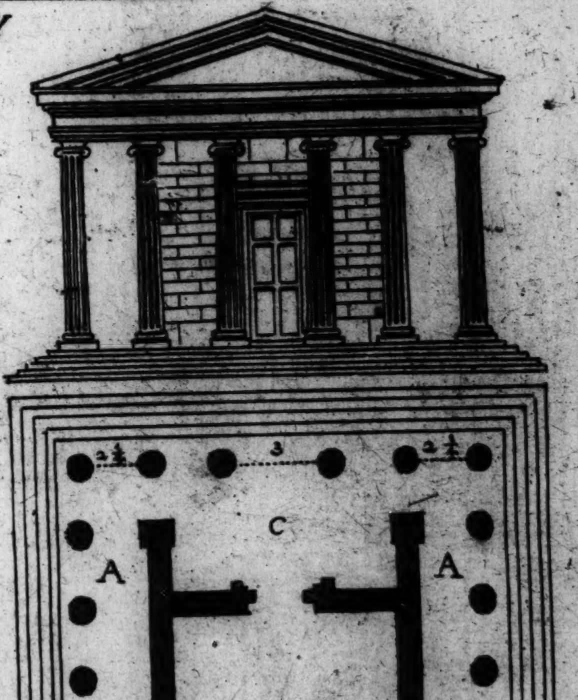

Plate IV.

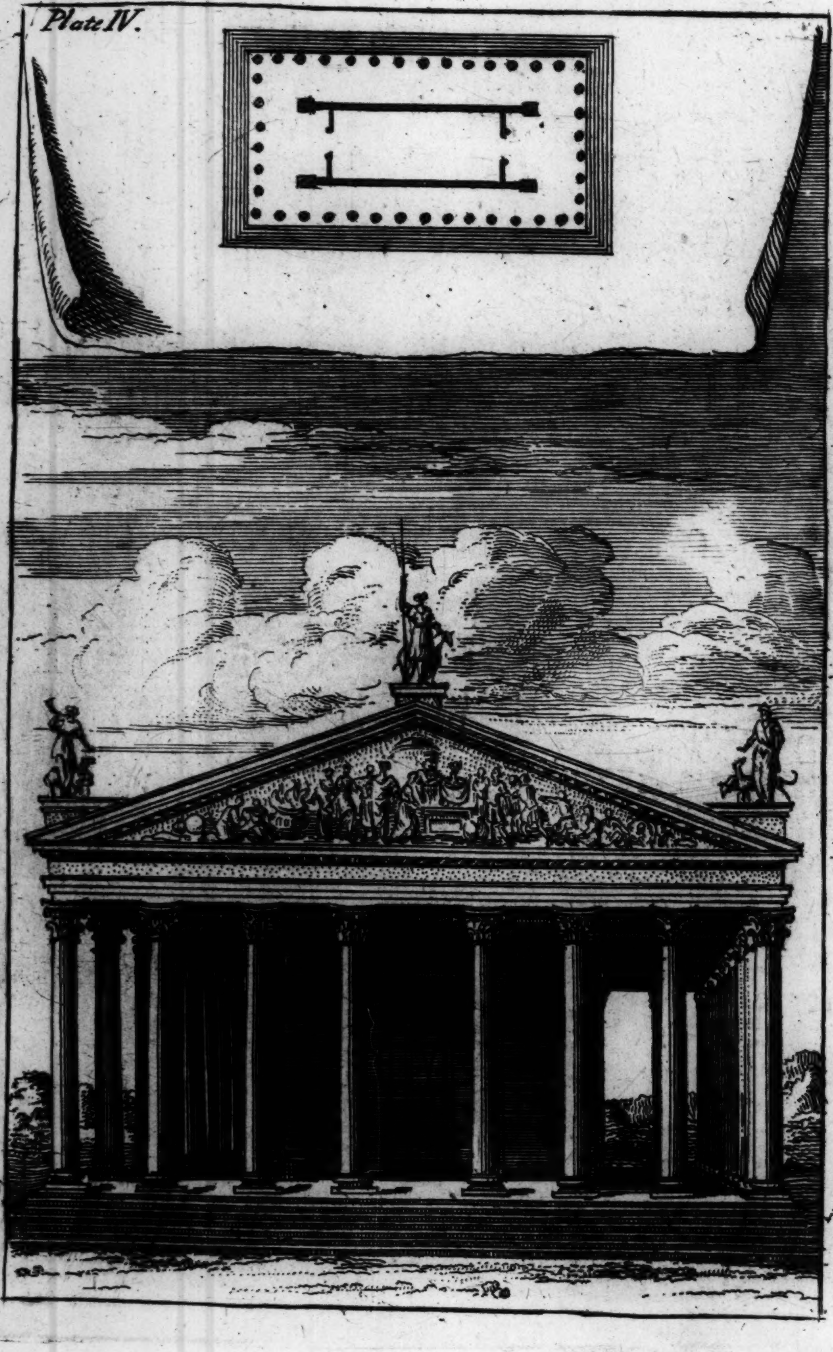

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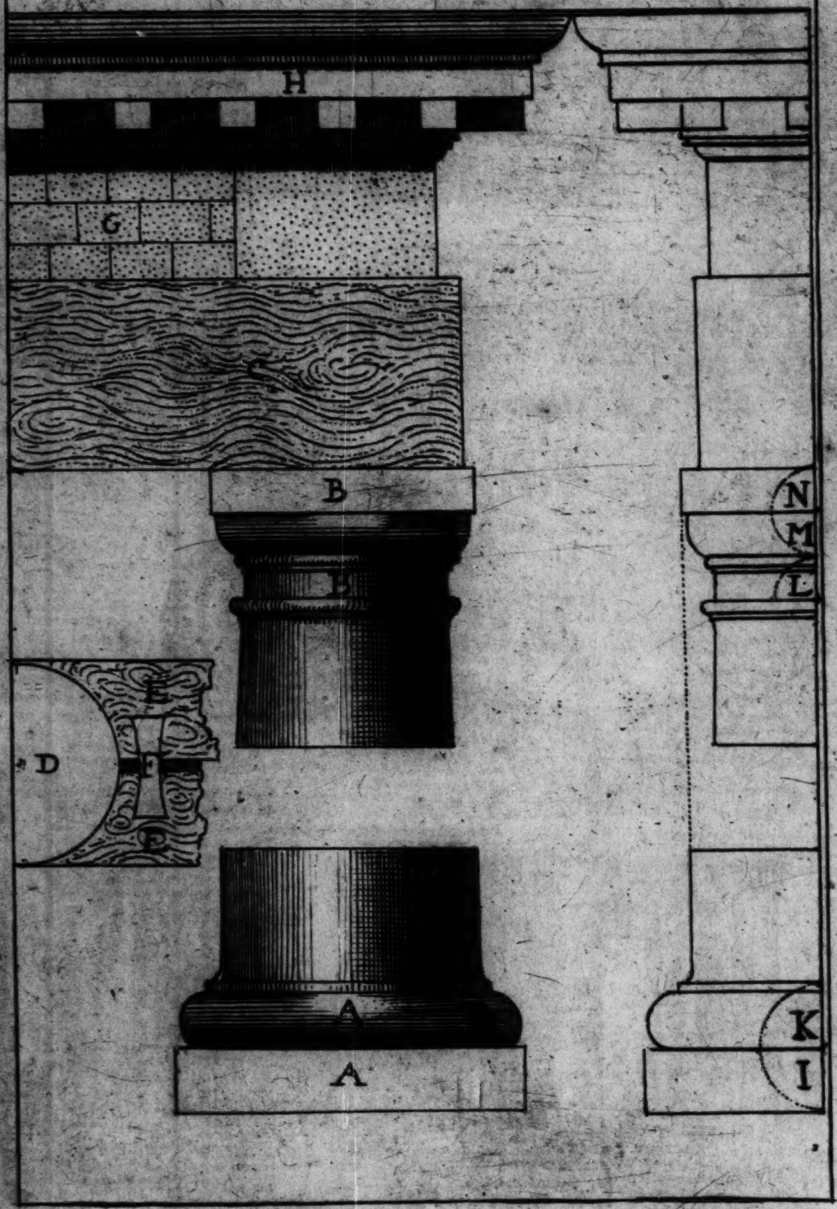
Plate V.



The Explanation of the Fourth PLATE.

THE Fourth PLATE contains the Plan and perſpective Elevation of a Temple, called *Hexaſtyle* and *Pſeudodyptere, viz.* VVhich has ſix Colums in the *Faces*, before and behind, and which has ſimple *Porticos*, but which are as large as the two *Porticos* of the Temples which have them double. This Plan and this Elevation may ſerve for other Temples, which as to what concerns the eſſential parts explained in the precedent Figure, are like to this, as are the *Periptere*, and the *Hyperthre*, which only differ in the number of Columns, or ſuch like circumſtances.

The Explanation of the Fifth PLATE.

THE Fifth PLATE contains the Proportions of the *Tuſcan* Order. AA is the Baſe of the Column, which has for its height the firſt Semidiameter of the Column. It's divided into two equal parts; that below is for the Plinth, marked I; that above, marked K, is for the *Torus*, and for the *Conge* or *Apophygis*. BB is the Capital, whoſe height is equal to its Baſe: It's divided into three; the firſt marked L, is for the Gorge, with the Conge and the Aſtragal; the ſecond, marked M, is for the *Echinus* or *Quarter-round*; the third, marked N, is for the *Plinthus* or *Abacus*, called by the French *Taillior*. C is one of the *Faces* of the *Sabliers* which ſerve inſtead of an Architrave. EE is the under part of the *Sabliers*, which anſwers to the Diameter on the top of the Column, marked D. F is a Tenon ſhaped like a Swallows-Tayl, which joyns the two *Sabliers* together. G is the little VVall which ſerves for a Frieze. H is the Cornice.

THE

The Explanation of the Sixth PLATE.

THE Sixth PLATE contains the Proportion of the *Doriek* Order; AB is the top of the Shaft of the Column; this top ſhews the Plan of the two ſorts of *Channelling* or *Fluting*, which are particular to the *Dorick* Order The one half, has Channelling that is not hollowed, and makes only *Flat Faces* or *Pans*. B is the other half, which has Channellings a little hollowed, *viz.* one quarter of the Circle: They are formed by the help of a Square C, whoſe ſides are equal to every one of the Pans. DEF is the Capital divided into three equal parts. D is for the Gorge; E is for the *Echinus*, and for the *Annulets* or *Rings*; F is for the *Abacus*; G is the *Architrave*; H the *Triglyph*; I the *Metop*; K the *Demi-metop*; L the *Cornice*; M are the ſix *Pendant Drops* which are under the *Triglyph*; N O are the *Pendant Drops* which are in the Cieling of the Cornice.

The Explanation of the Seventh TABLE.

THE Seventh PLATE contains the Proportions of the *Jonick* Order and the *Attick* Baſe: A is the *Plinth* of the *Attick* Baſe, which is the third part of the whole Baſe, of which the upper part is the fourth part of what remains after the *Plinth* is taken; the inferiour part is the of what remains, and the other half is the *Scotia*. CD is the *Jonick Baſe*, which is the third part of the whole height of the whole Baſe. E is the *Thorus* which contains three parts of ſeven, into which is divided what remains, the orher four being for the two *Scotia*'s and the two Aſtragals, which are betwixt the *Thorus* and the *Plinth*. F is the *Capital*, whoſe Proportion is explained in the eighth PLATE. G, HI, K,

is

Plate VI.

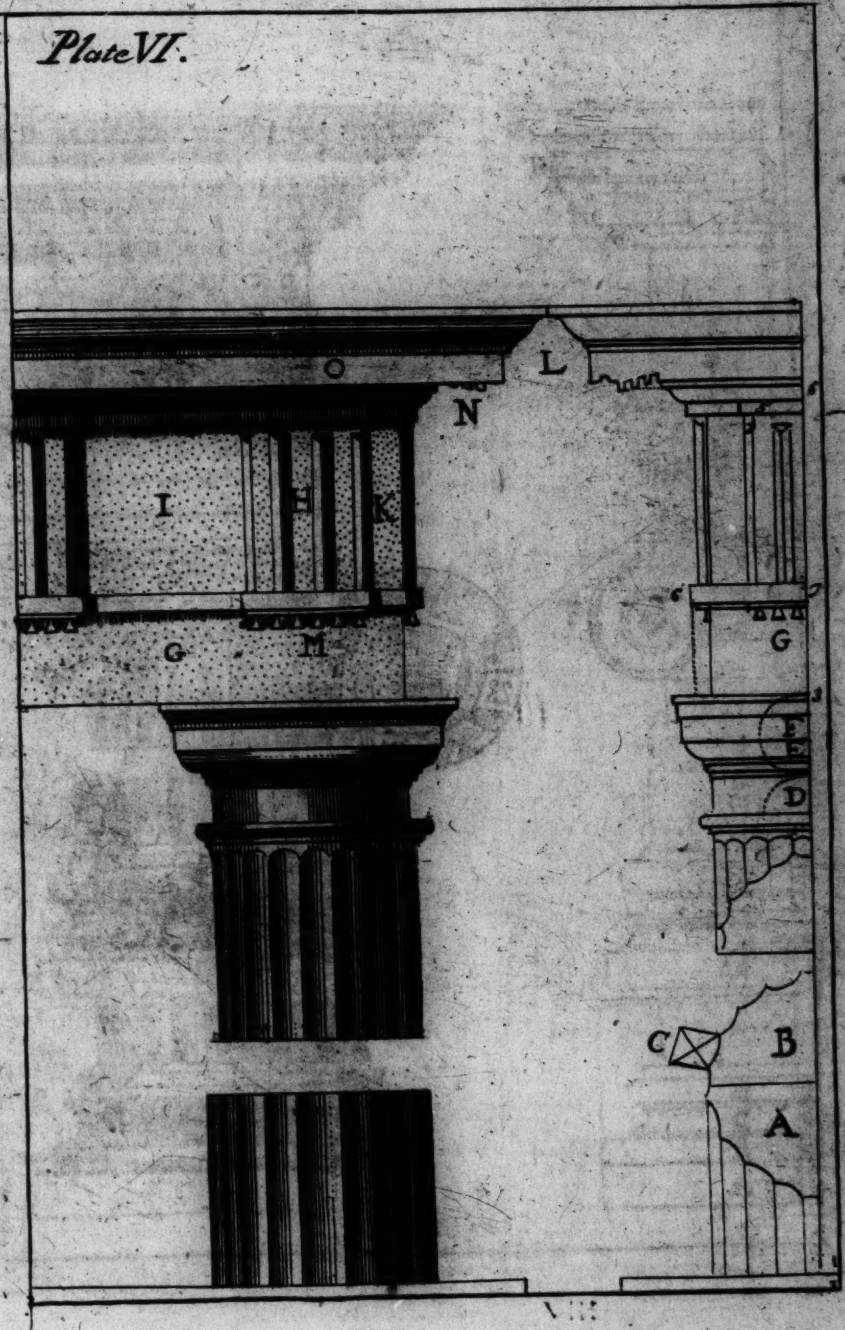


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Plate VII

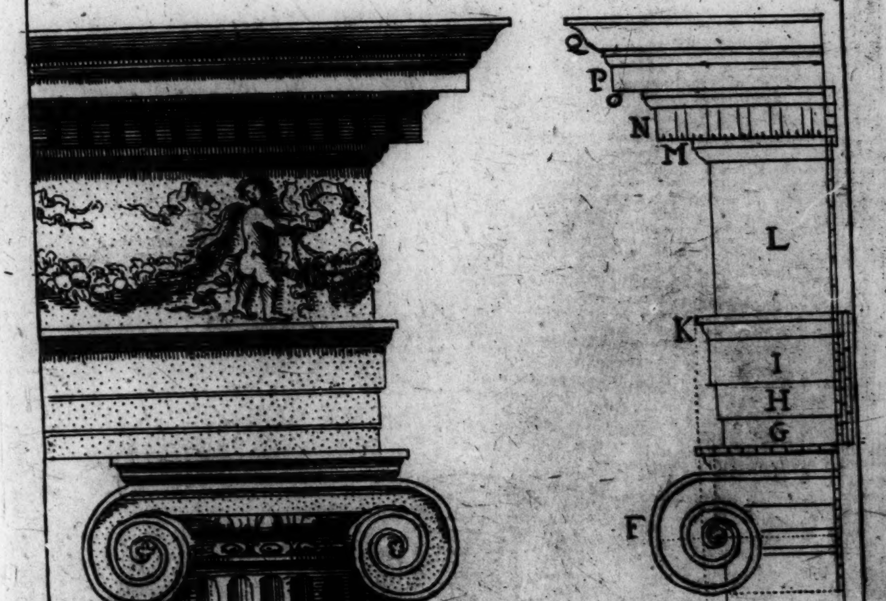
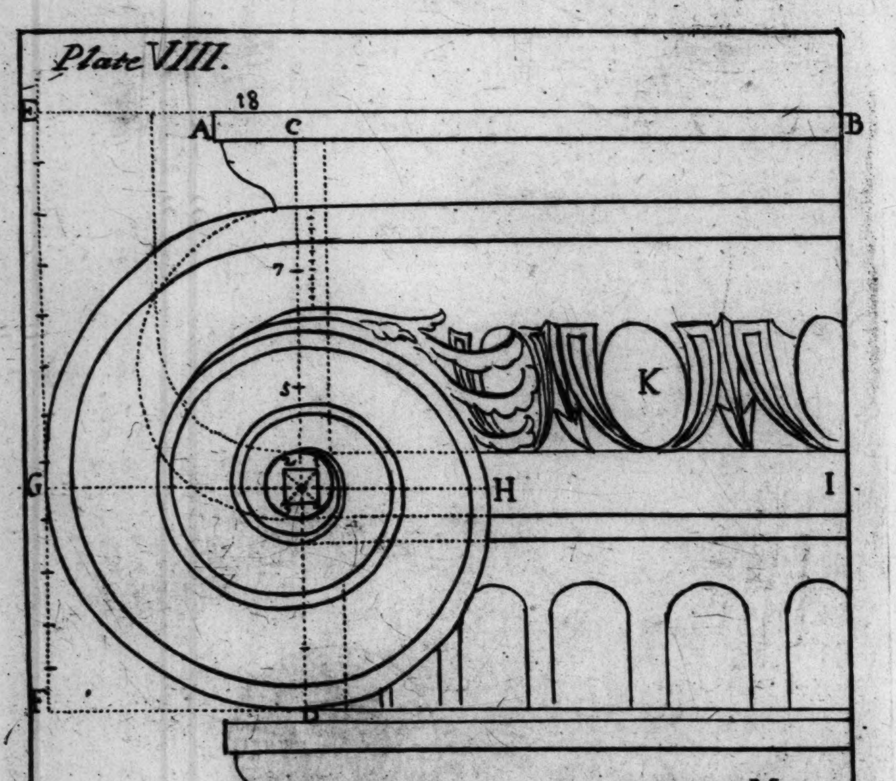


Plate VIIII.



is the *Architrave*, which has four parts. *viz*. the Face marked G; the ſecond marked H; the the third marked I, and the *Cymaticum* or *Simaiſe*, marked K, L is the *Frieſe*. M, N, O, P, Q is the *Cornice*. M is the firſt *Cymatium*; N is the *Dentil*; O is the ſecond *Cymatium*; P is the *Crown* with its little *Cymatium* or *Simaiſe*.

The Explanation of the Eighth PLATE.

THE Eighth PLATE contains the Proportions of the *Ionick* Capital, of which only half is ſeen here: A B is the half of the breadth of the Abacus, which is regulated according to the breadth of the bottom of the Column, of which one half is marked B 18; For the bottom of the Column being divided into 18, 19. are allowed to the Abacus: AC is the *Retreat* which muſt be made of the Corner of A, of the Abacus inwardly, to draw the Line C D, which muſt regulate the *Eye* of the *Volute* over which it muſt croſs as it paſſes. To make this *Retreat* we muſt take one part and a half of twelve, into which is divided the height or thickneſs, E F, of the whole Capital, which height is equal to half the breadth of the Abacus. This height, marked C D, is divided into nine parts and a half, of which one and a half is given to the *Abacus*, and a half from the Abacus to the middle of the *Eye*, which is traverſed by the line G H; the Figures 1, 2, 3, 4, mark the four Centers of the firſt four quarters, of the Volute; the four ſecond quarters, and the four third (for the Volute has twelve) are taken in the Diagonal 1, 3, and 2, 4. H, I, is the Aſtragal at the top of the Pillar which anſwers to the *Eye* of the Volute. KK is the Egg or *Echinus*; L is the Axis of the Volutes; MM is the Cincture of the lateral part of the Volutes.

THE

The Explanation of the Ninth PLATE.

THE Ninth PLATE contains the Proportions of the *Corinthian* Capital, which makes all the diſtinction betwixt the *Jonick* and the *Corinthian Order*, A is the *Corinthian* Capital, which has for its height only the Diameter of the bottom of the Column; B is the Capital of the *Pantheon*, which is higher by a ſeventh part, *viz.* the thickneſs of the *Capital* divided into ſeven, of which the *Abacus* has one, the *Voluta*'s and *Foliages and Stalks* two, the Foliage in the Range above two, and that in the Range below two. To have the breadth of the *Abacus*, we muſt give its Diagonal E F the double of its height C D. To have the greateſt and juſt Proportion, of its bending H, we muſt divide the breadth of the *Abacns* E G into nine parts, and give it one.

At the bottom of this Plate is repreſented the the Herb *Brank-Urſine*, which grows round about the Basket, which is covered with a Tile, from which *Vitruvius* ſays the Sculptor *Callimachus* took the firſt Model of the *Corinthian* Capital.

The Explanation of the Tenth PLATE.

THE Tenth PLATE contains the Plan and Elevation of the Theatre of the *Romans*. AA is the *Portico* which went round the Theatre below. BB are the Entries through which they paſſed from the Portico's into the *Orcheſtra* C. KDEDK the *Pulpitum* or *Stage*; MM the *Landing-place*, which ſeparated the Steps or Seats above from thoſe below: LM the Stairs which are between the degrees. NN the Portico above in the Theatre. PP the Paſſage under the Steps. TT the Stairs by which they mount to the Porticos

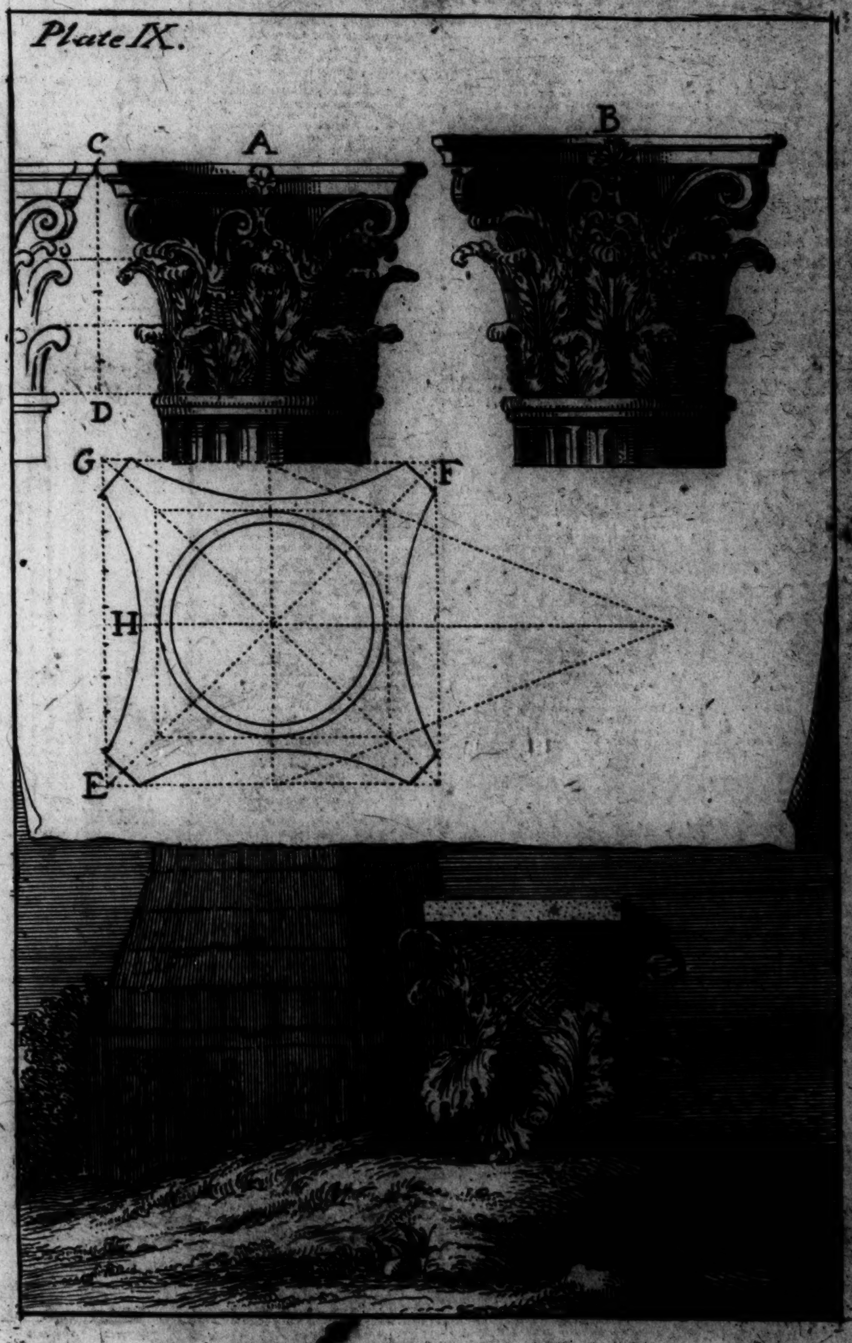


Plate IX.
C
A
B
D
G
F
H
E

THEATRUM ROMANUM.

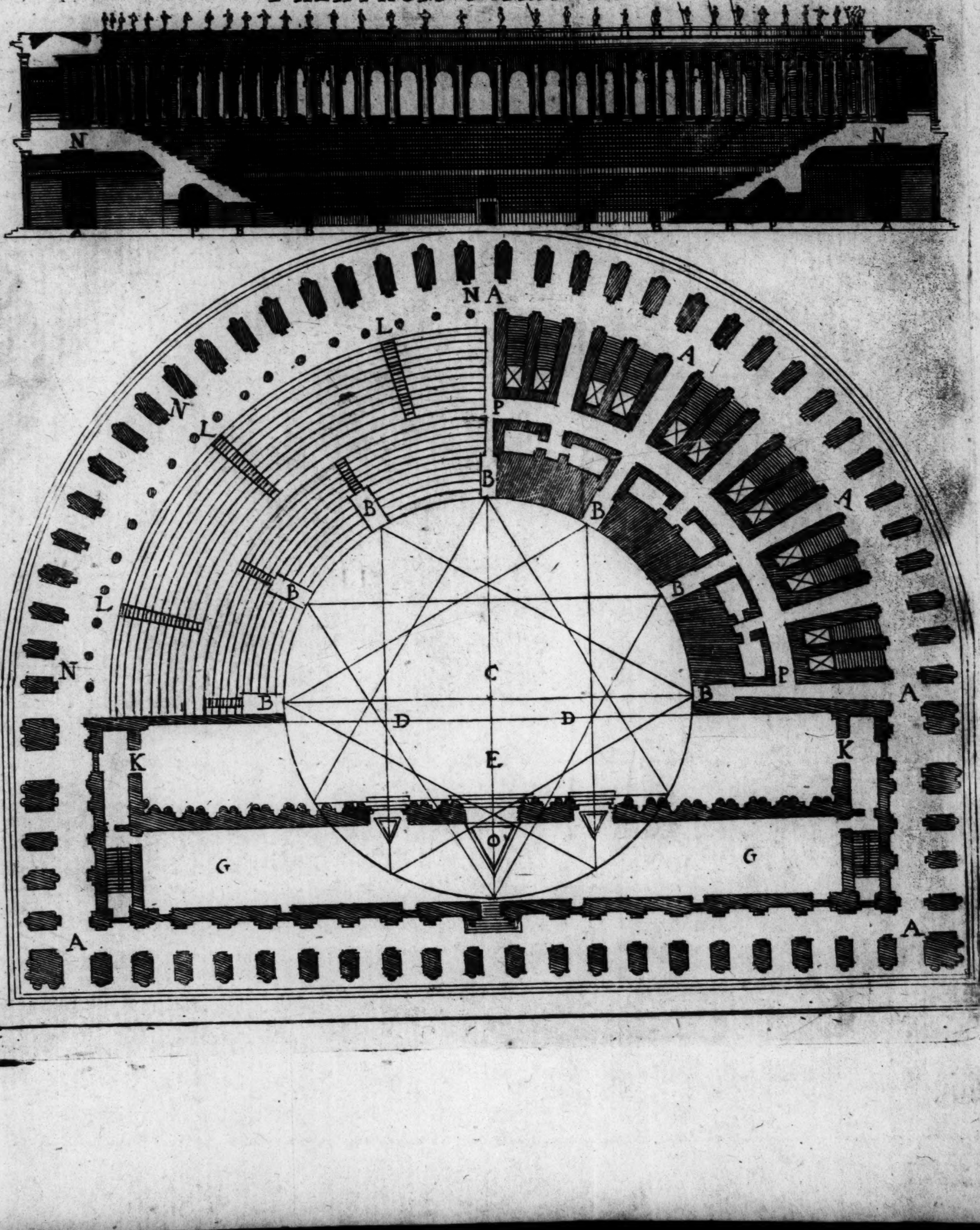
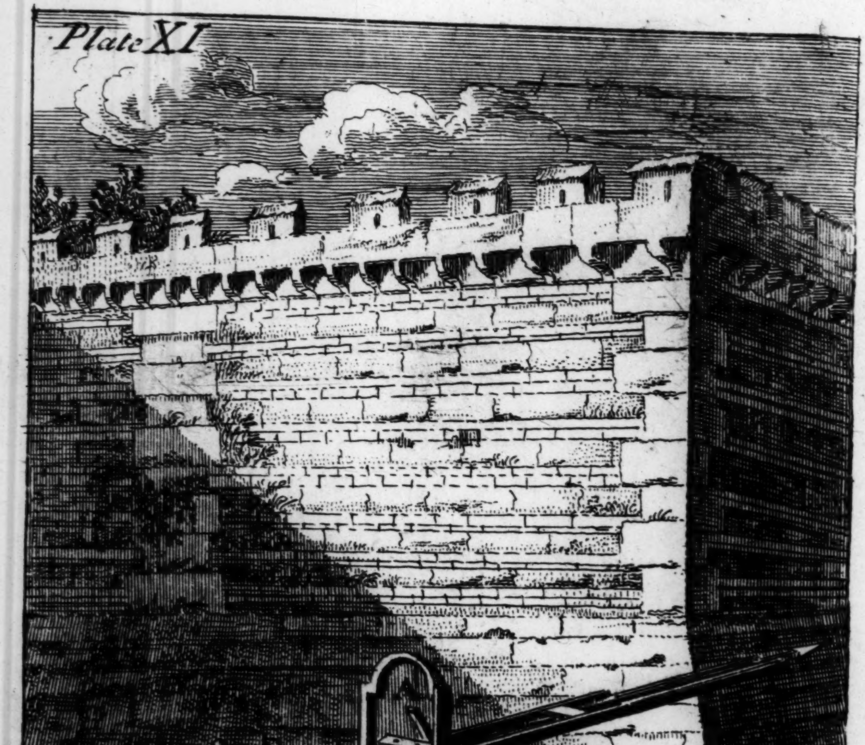


Plate XI



tico's above. K I H I K the Scene. H the royal Gate. I I the Gates of Strangers. K K the Gates in returning. OOO the Machines uſed in ſhifting the Scenes. G G the part of the Theatre behind.

The Explanation of the Eleventh PLATE.

THE Eleventh PLATE contains the Explication of the *Catapulta*, which was a Warlike Inſtrument uſed by the Ancients to dart Javelins of an extraordinary bigneſs. A A are the two Beams one againſt the other, and joyn'd, which after having been cloſe, puſh'd the Javelin with great force when they were unbent. There is one of theſe Beams, which is repreſented as being joyned to the Capital of the Machine by an Iron Pin, the other ready to be joyned when the Maſter of the Machine who ſounds the Cord with his right Hand ſhall have heightned or let down, the end marked C, as much as is neceſſary, to give it an equal Bent to that of the other. This is done by the help of an excentrical piece, which is traverſed by a Cylinder, which the Maſter turns with a Leaver, which he holds in his left Hand. D, E E are the holes through which the Rope paſſeth to draw the Beams. F is the end of one of the Beams repreſented in great. G is one of the Pins which travers'd a round Eye, by the help of which the Beam is joyned to the Capital. H is the Cylinder that traverſes the excentrical piece I.

Explication of the Hardeſt Terms in Architecture.

A

ABacus, from ἄϐαξ; which ſignifies a ſquare Trencher: In French it's called *Tailloir*; it's that quadrangular Piece commonly accompanied with a *Cymaticum*, and ſerves inſtead of a *Drip* or *Corona* to the Capital. It ſupports the nether *Face* of the *Architrave* and whole *Trabeation*.

Acroteria or *Acroteres* from ἀκρὸν, *Summa pars*; they may be properly called *Pinnacles*, for *Pins* and *Battlements* were made ſometimes more towring;

but when they ſtood in *Ranges* with *Rails* and *Baliſters*: Upon flat Building they ſtill retained their Name, with this only difference, that ſuch as were plac'd between the *Angular* Points, were ſtiled the *Median*, or middle *Acroteria*.

Annulets, are little ſquare Parts turned round in the *Corinthian Capital*, under the *Quarter-Round*, called *Echinus*.

Ante, is a ſquare Pillar, which the Ancients placed at the corners of the Walls of the Temples.

Amphiproſtyle, was a ſort of a Temple which had four Columns in the Front of the Temple, and four in the Face behind.

Architrave, is the firſt Member of that which we call *Entablature*; in Chimnies the *Architrave* is the *Mantle*; over the *Jambs* of the Doors and Lintels of Windows, it's called the *Hyperthron*.

Aſtragal, from the Greek word 'Αϛράγαλος, which ſignifies the *Vertebræ*, or little Joints in the Neck or Heel; hence the French call it *Talon*, or the Heel it ſelf: It's a Member of *Architecture* joyned to *Baſes*, *Cornices*, *Architraves*, *&c.* it's round like a Ring, and therefore i'ts called by the Italians *Tondino*.

Attick, ſignifies after the manner of the City of *Athens*. In *Vitruvius* it's the Name of the *Baſis* which the Moderns have given to the *Dorick* Pillar. We call *Attick* in our Buildings, a little Order plac'd upon another much greater; for inſtead of Pillars, this little Order has commonly nothing but Pillars of a particular Faſhion.

Apophyges, vide *Conge*.

B

B*Aſilica*, was a great Hall which had two Ranges of Pillars, and had two Iſles or Wings, upon which were Galleries: Theſe Halls, which at firſt were made for the Pallaces of Kings, were afterwards turned into Courts of Juſtice, and after that into Churches; which Form has always been obſerved.

Balluſtre, is the lateral part of the *Jonick* Capital. Our Workmen have given it that name, becauſe it ſomewhat reſembles a *Balluſter*

C

CHannel, in the *Jonick* Capital, is that part which is under the *Abacus*, and lies upon the *Echinus* or Egg, and which has its *Contours* or Turnings on every ſide to make the Voluta's.

Cariatides, are Statues of Women, which ſerve inſtead of Pillars.

Cincture is that part which makes the middle *Congè* in French, in Latin *Aphophyges*. from the Greek word ἀπόφυγη, becauſe that part of the Pillar taking as it were a riſe, ſeems to fly from the *Baſis*, it's no more than the *Rings* or *Ferils* heretofore uſed at the Extremities of Wooden Pillars, to preſerve them from ſplitting, afterwards imitated in Stone-work.

Corona, is properly that part of the Cornice which the French call *Larmier* and we *Drip*. becauſe it defends the reſt of the Work from Wind and Weather: It is often taken by *Vitruvius* for all Cornice.

Corona, called the *Plat* or *flat Crown*, is a particular Member in the *Dorick* Gate; it's made by ſo extraordinary an enlargement of the *Face* of the *Corona* or Drip, that it has ſix times more Breadth than Projecture. This ſort of *Corona* is no where found among the Ancients, but only in the Writings of *Vitruvius*.

Cymatium, from κυμάτιον, which ſignifies a rolling *Wave*; is a Member of Archtiecture, of which the one half is *Convex* and the other *Concave*, the one being hollow above, and the other below. There are two ſorts of them, the one called the *Gola* or *Throat*, or the *Doucine*, whoſe advanc'd part is *Concave*; and the other is called by the French the *Talon* or Heel, whoſe advanced part is hollow below, as the firſt is above.

D

DIE is the middle of the Pedeſtals, *viz.* that which is between their *Baſis* and their *Cornice*. It's ſo called, becauſe it's for the moſt part of a Cubic form, as *Dies* are that are uſed at Play.

Dentils, or Teeth, is a Member of the *Jonick*

Cornice, which is ſquare, and cut out at convenient diſtances, which gives it the form of a Set or or Gang of Teeth:

Diaſtyle, from διὰ and στύλος *Columna*: Is a ſort of Edifice where the Pillars are diſtanced one from another the breadth of 3 Diameters of the Pillar.

Diptere, from δὶς and πτέρον, *Ala* ſignifies that which has a double Iſle or Wing; the Ancients called ſo, the Temples, which were ſurrounded with two Ranges of Pillars, for there two *Ranges* made two *Portico*'s, which they called *Wings*, we *Iſlet*, from the French word *Ailes*, which ſignifies *Wings*, becauſe as Wings are on the ſides of Birds, ſo theſe of Edifices.

E

E*Chinus*, from ἀπὸ τῆς ἐχίνου, a *Hedg-hog*; it is a Member of Architecture, which we call a *Quarter-round*; it has its name from the Roughneſs of its Carving, reſembling the prickly Rind of the Cheſnut, and not unlike the Hedg-hog; it's commonly next to the *Abacus*, and carved with Ovals and Darts, ſometimes called Eggs and Anchors, becauſe theſe ſuppoſed Cheſnuts are cut in an Oval form.

Entablature ſignifies properly the Flooring or Lofting with Boards; it comes from the Latin word *Tabulatum*. In Architecture it's that part which is compos'd of the *Architrave*, *Frieſe*, and *Cornice*, for in effect this part is the extream part of the Flooring, which is ſupported by Pillars, or by a Wall if it have no Pillars.

Eye is the middle of the *Jonick* Volute, which is cut in the form of a little Roſe.

Euſtyle, from εὖ *bene*, and στύλος *a Pillar*; it's the Order where Pillars are rightly placed, the Intercolumniations being two Diameters and a quarter.

F

F*Ace* is a Member of Architecture, which has a great Breadth and a ſmall Projecture; it's in *Architraves*.

Filet is a little ſquare ſtreight Member.

Freſco, to paint in *Freſco* is an Italian Phraſe, and it ſignifies the Painting which is made upon the Plaiſtering before it be dry.

Frieſe is that part which is between the *Architrave* and the *Cornice*.

G

Gnomonick is the Art of making Sun-dials; it's derived from the Greek γνώμων, which ſignifies that which ſhews a thing, as the Cock or Pin of the Dyal ſhews what a Clock it is.

Gorge, or the *Gule* or *Neck*, is the narroweſt part of the *Dorick Capital*, which is between the *Aſtragal*, above the Shaft of the Pillar and the Annulets.

Gutte, or *Drops*, are little parts, which to the number of ſix are put below every *Triglygh* in the *Archittave* of the *Dorick Order*.

H

Hydraulick, from the Greek ὕδωρ; which ſignifies Water, is an Engine that plays by the help of Water.

Hypethre, from ὑπὸ *ſub*, and αἴθρα αἰθὴρ *æther*, ſignifies a Building whoſe inſide is expoſed to the Rain and open Air. The Ancients call'd ſo all Temples that had no Roof.

Hyperthyron, for ὑπὲρ *ſuper*, and θύρα *Janua*, a Gate or Door; it's a large Table, which is upon the *Dorick* Gates in the manner of a *Frieſe*.

I

Ichographie, from ἴχνος *veſtigium*, and γράφω *Scribo*, properly ſignifies the Figure that the Sole of the Foot impreſſes upon the Earth. By it in Architecture is underſtood that which is commonly called the *Plan* of the *Edifice*.

L

Lacuner, is the *Flooring* or *Ceiling* above the *Portico's*.

Laconicum was a dry Stove to ſweat in: It was ſo called becauſe it was much uſed by the *Lacedemonians*.

Larmier or *Drip*, vide *Corona*.

M

Metope, from μετ' ὀπὴ μετ' ὀπαὶ, and *foramen, intervallum* Signifies the Front; it's the Name of the empty ſpaces in *Friezes* of the *Dorick Order*, between her Triglyphs.

Modillion ſignifies in *Italian* a little Model, a little meaſure: It's that part which is ſo often repeated in the *Corinthian* and *Compound Cornice*, which ſupports the Projecture of the *Larmier* or *Drip*. This part is called the little *Model* in reſpect of the great Model, which is the Diameter of the Pillar; for as the Proportion of an Ediſice depends on the *Diameter* of the *Pillar*, ſo the the greatneſs of the Modillions, their number, and their ſpace or diſtances, muſt have a juſt Proportion or true Relation to the whole Fabrick.

Module or *Model*, is meaſure that is made uſe of to regulate all the Proportion of the *Fabrick*: In the *Dorick Order* it's half the *Diameter* of the Pillar. in other Orders the Model is the whole *Diameter*.

Monoptere, from μόνος *ſolus*, and πτερὸν *ala*; is that which has but one Wing or Iſle; it was a ſort of a round Temple, whoſe Roof was ſupported by Pillars only.

Mutuli, from μύτιλος, which ſignifies defect, as being made thinner, and more abated above than below. It's a ſort of a Modillion in the Cornice of the *Dorick* Order.

O

O*Rcheſtra*, from ὀρχέομαι *ſalto*; ſignified the place where they danc'd; it was the loweſt place in the Theatre, which was between the Stage and the Seats where the Spectators ſat. It was in this place where the Greek Comedians were wont to dance.

Order. Thoſe Fabricks are ſaid to be of different Orders, when the Proportion which is between the thickneſs of the *Pillars* and their height, with all other things which are are required to this Proportion, are different.

Ornaments, *Virtruvius* ſo calls the *Architrave*, *Frieſe* and *Cornice*.

P

P*Araſcenium*, is the back part of the Theatre or Scene.

Periptere, was a ſort of a Temple, which had Pillars on all the four Parts, which was diffrent from the *Proſtyle*, which had only Pillars before, or in the *Front*, and from the *Amphiproſtyle*, which had only

Pillars before and behind, and none on the ſides.

Periſtyle, ſignifies that which has Pillars round about; It differs from the *Periptere* in this, that the Pillars of the *Periſtyle* are within, as it were round about a Court. and thoſe of the *Periptere* are without, as in the Temples of the Ancients.

Pedeſtal, is that part which ſupports the Pillar.

Pied-droit, or *Pier*, is a ſquare Pillar, which is in part within the Wall.

Pillaſter is the ſame, with this Difference, that the Pillaſter has a *Baſe* and a *Capital*, as a *Pillar* hath, which the *Pied-droit* has not.

Plat-band is a ſquare Member, which terminates the *Architrave* of the *Dorick Order*, and paſſes immediately under the Triglyphs.

Plinthus ſignifies a Brick or ſquare Tile. It's in Architecture taken for that ſquare Member which makes the Foundation of the Baſe of the Pillar.

Poſticum is the back Gate of a Fabrick.

Portico is a long place covered with a Floor or Cieling, ſupported by Pillars.

Proſcenium, ſignifies the fore part of the Stage; it was an Edifice as high as the laſt Portico of the Theatre, whoſe Face or Front was adorn'd with many Ranges of Pillars.

Proſtyle, ſignifies that which has Pillars before only. This was one ſort of the Temples of the Ancients.

Pſeudodiptere, or *falſe Diptere*, was a kind of of a Temple among the Ancients, which had *Porticoes* round about, which were every one as large as the double *Portico* of the *Diptere*.

Pſeudoperiptere, was a ſort of a Temple, where the Side Pillars were part in the Wall of the inner ſide of the Temple, which was enlarged ſufficiently to encloſe within the ſpace which was allowed the Porticoes of the Periptere.

Pulpit, was the place upon which the Comedians acted, which we now call the Stage.

Pycnoſtyle, ſignifies a Building where the Pillars were very cloſe one to another; ſo that the *Intercolumiation* had but a *Diameter* and a half of the Pillar.

R

RUdus, was a ſort of groſs Mortar, which was made uſe of for equally filling and levelling the Superfices of the Walls, before the fine Plaiſter was laid on: It was likewiſe made uſe of for the ſecond *Bed* or *Lay* of the Flooring.

S

SCene, was in the Theatre of the Ancients a great *Face* or Front of Building, adorned with Pillars and Statues, which had three great Openings, in which were Pictures in Perſpective, which repreſented the Lodgings where the Tragedians and Comedians dwelt.

Sabliere, is a piece of Wood as long as a Beam, but not ſo thick.

Scotia, is a Member of Architecture, hollowed as a Demi-channel: It's particularly uſed in the Baſes, where it's placed, between the Torus and the Aſtragals; it's ſometimes put under the *Drip*, in the Cornice of the *Dorick* Order.

Statumen, ſignifies generally whatſoever is made uſe of to ſupport any thing in Architecture; it is Mortar mixt with Pebbles, which ſerv'd for the firſt Lay or Bed in Flooring.

Syſtyle, ſignifies Building where the Pillars ſeem to be joyned together, for the *Intercolumnation* is but of two Diameters of the Pillars.

T

TOrus is a Member in the Baſe which is round, in the form of a great Ring; it comes from the Latin word *Torus*, which ſignifies a Bed.

Tringle is a little ſquare Member, which is directly upon every *Tiglygh*, under the Platt-band of the *Architrave*, from whence hang down the *Guttæ*, or pendant Drops in the *Dorick Order*.

Triglyph, is a Member in the Freeze of the Dorick Order, directly upon every Pillar, and in certain ſpaces in the *Intercolumnations*.

Tympan ſignifies a Drum; it's that part of the bottom of the Frontons, which anſwers the Naked of the Freeze; it is triangular, and placed upon the Cornice of the Entablature, and cover'd over again with two other Cornices which ſlope a little.

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V

VOlute or Scroll, is part of the Capitals of the *Jonik*, *Corinthian*, and *Compound Orders*, which repreſent the Bark of a Tree twiſted and turned into a Spiral Line.

X

XYſte, was the place where the Wreſtlers exerciſed.